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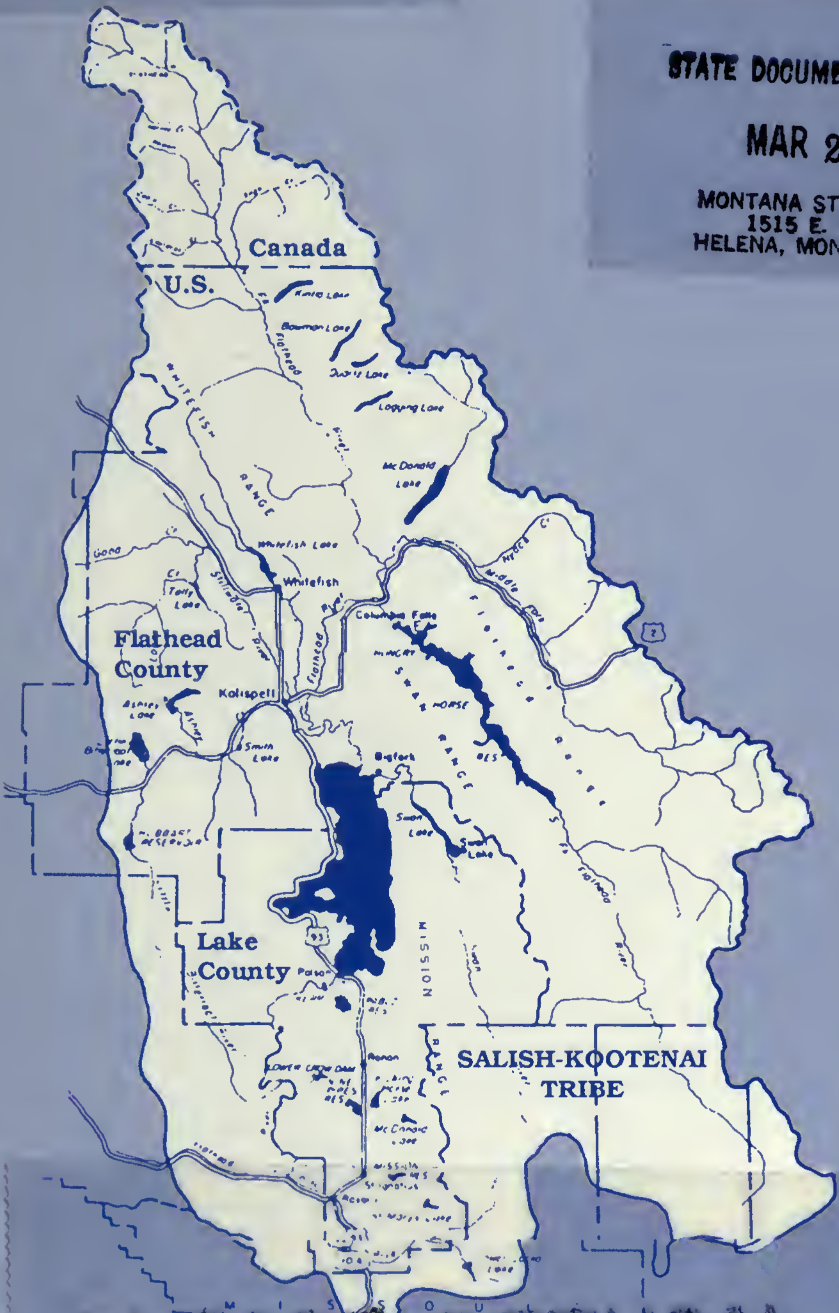

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Our Clean Water -- Flathead's Resource of the Future

Proceedings of a conference held
April 25 & 26, 1988
Kalispell, Montana

Hosted by:
The Flathead Basin Commission

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the Northwest Area Foundation

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The Flathead Basin Commission wishes to thank the Freshwater Foundation and the Northwest Area Foundation for providing the grant which made this conference and the proceedings possible. We also wish to show gratitude to Christine Olsenius, Vice President of the Freshwater Foundation, for her professional guidance. Brace Hayden, FBC Executive Director, provided invaluable leadership which made this a successful conference. Jennifer Lewis, FBC secretary was responsible for the myriad of conference related details. We also wish to thank the thirty conference sponsors who helped promote the conference and sent representatives. We are grateful to the Army Corps of Engineers for providing the printing of this document. The Commission is particularly thankful for the participation of the thirty speakers who contributed their many thoughtful comments and ideas. We also wish to acknowledge the facilitators and the registration assistants whose help was invaluable towards the success of the conference. And finally we wish to thank Gil Lusk, Superintendent of Glacier National Park, whose humor and masterful skill as conference moderator, made the two day conference enjoyable, cohesive, and productive.

Craig J. Hess
Public Education Coordinator
Flathead Basin Commission

FORWARD

The Flathead Basin Commission has recieved funding and assistance from the Freshwater Foundation through a grant from the Northwest Area Foundation to initiate a comprehensive public education program. The goal of the program is to increase public understanding and involvement regarding the water quality problems facing Flathead Lake and other water bodies in the basin. Recognizing that water quality problems are primarily social, economic, and political in nature, the implementation of solutions requires enhanced public understanding of the problems. This conference was the plenary event of the public education program.

Over the two day gathering a variety of water quality related issues were discussed and presented by 30 distinguished speakers and panelists. In attendance were two hundred and fifteen people registered for the conference. They represented a broad spectrum of Flathead-area interests that included business, citizen, tribal, educational, agricultural, health, water-quality experts, and elected officials. A profile of those registering is as follows:

REGISTRANT PROFILE IN PERCENT

14%	Citizen		
14%	Business		
10.5%	Conservation Organization		
9%	Forestry		
		4%	Industry
		2.5%	Federal
		1%	State
8%	Health		
		6.5%	County or City
		1.5%	Physicians
8%	Water Quality Officials		
		2%	City/Water & Sewer Dist.
		4%	State
		1%	Tribal
		.5%	Federal
8%	Teacher/Educator/Scientist		
8%	Other Agency		
		1.5%	State
		2%	Flathead Basin Com.
		4%	Federal
		.5%	County
4.5%	Agriculture		
		1%	Farmer
		2.5%	Conservation District
		1%	State Official
4.5%	Fish & Wildlife Agency		
		1%	Tribal
		3%	FWP
		.5%	USF&WS
3.5%	Conf. Salish & Kootenai Tribe		
3.5%	Planning Officials		
3%	Elected Officials		
		1.5%	Legislative
		1%	Mayor
		.5%	County
1.5%	Water Rights (State)		
1%	Lobbyist		

INTRODUCTION

The citizens of the Flathead River Basin have a long history of water quality protection efforts. The five year Flathead River Basin Environmental Impact Study, completed in 1983, left little doubt that water quality in the Flathead Basin is deteriorating at an accelerating rate. Unfortunately, there is no simple way to slow the transformation. A portion of the problem is technical - pinpointing the sources of the pollution. A portion is administrative - coordinating the many agencies that share jurisdiction over important resource-related decisions. And a portion is economic - weighing the cost and benefits involved in ending pollution while ensuring a thriving economic climate.

None of these problems is paramount to the others. The pathway to finding solutions is to follow a coordinated community approach with sometimes diverse interests pulling together for the common good.

The Flathead Basin Commission believes that insuring water quality protection and maintaining a strong economic environment in the Basin must go hand-in-hand. The role of the Flathead Basin Commission is to coordinate and help implement the solutions which fulfill the needs of the community.

The purpose of this two day regional conference was to bring together a diversified group of individuals to discuss water issues facing Basin citizens. The conference examined the state of the region by looking at past water quality efforts; by reviewing the current status of water conditions; and by conducting a panel discussion that focused on the effectiveness of governmental regulations. In addition, experts from neighboring Western states presented case studies that showed how water quality conflicts are being resolved in their areas. The second day of the conference focused on the economic relationship of clean water and the future of the basin.

On the afternoon of the final day, conference participants divided into small working groups to identify the priority issues that will influence the environmental and economic future of the Flathead Basin. This feedback, included in these proceedings, will be incorporated into the Flathead Basin Commission's plans of action for the years to come.

Brace Hayden
Executive Director
Flathead Basin Commission

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Instructor
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Role of the Flathead Basin Commission

JEAN TURNAGE

Chief Justice, Montana Supreme Court

Last January, Brace Hayden, the Executive Director of the Flathead Basin Commission, called me and asked if I would make some remarks at this regional conference on "Our Clean Water - Flathead's Resource of the Future". I consider it an honor to have been asked and a privilege to be here this morning.

My purpose, if I may briefly impose upon the valuable time allotted your conference, is to provide some insight into the origin, purpose and passage by the Legislature, of the Flathead Basin Commission Act of 1983.

In the Fall of 1982, I was approached by concerned citizens of the Basin to discuss the problem of how to preserve and carry on the important and valuable federal study of water quality that had been on-going for approximately four years but was to end in June of 1983. It was apparent that unless some entity of a permanent nature was promptly created, the valuable resource of the federal study, and the time, effort and expense devoted to it, would be in jeopardy.

It was also apparent that the natural environment of the Flathead Basin, its land and water areas, is a unique and irreplaceable natural resource, which in its present condition, was of relatively high quality, unspoiled and unequaled in the nation.

The goal was, and is, to keep this resource in that condition and to improve where improvement is indicated. With the essential advice, assistance and encouragement of those concerned with the problem, several of whom became members of the original Commission, I drafted and introduced Senate Bill 161, on January 15, 1983.

When legislation is clearly for the public good and is being considered by the legislature, it often receives broad-based support. Such was the case with Senate Bill 161. It passed the Senate with unanimous vote and passed the 100-member House with only two dissenting votes.

Appreciation must be expressed to Governor Ted Schwinden for his support during the passage of the bill and for his signing it into law on April 12, 1983; and also to Representative Francis Bardanouve, Chairman of the House Appropriations Committee, who introduced and guided into passage a modest appropriation that made the law operative.

The Flathead Basin consists of all land and water areas that drain into Flathead Lake and its tributaries. Within this significant area, there is located many public entities, Federal, State, local, Tribal and also a portion of Canada; and, of course, there is included within the area the private sector interests of all of the citizens who reside, work and pursue their economic and private goals within the Basin.

Among the responsibilities of the Flathead Basin Commission is the duty to monitor the condition of natural resources; to develop a monitoring plan with a cooperative strategy involving the public and private entities, both national and international; and to encourage economic development and use of the Basin resources without compromising the present high quality of the environment.

The importance of the monitoring plan cannot be overemphasized. Far too often, irreversible harm occurs because of benign neglect in perceiving what is occurring by imperceptible stages.

Likewise, the theme of cooperation that underlies the intent of the legislation is most important. Far too often, failure to communicate and cooperate leads to confrontation and polarization of competing views which, in turn, often leads to the terminal status of litigation where everyone looses, including the natural resource.

The Flathead Basin Commission offers a forum for the practice of participatory democracy where communication and cooperation between the public entities charged with protecting the environment and private interests within their jurisdiction are permitted to meet, discuss, reason and resolve issues. If they will do this, all of us and the natural assets of the basin will be served.

Perhaps the Flathead Basin Commission may become a model for the nation and a bright line to follow on a regional basis for the protection of nature's gifts to all of us.

CITIZEN INVOLVEMENT IN WATER QUALITY PROTECTION EFFORTS

DR. LEX BLOOD

Instructor
Flathead Valley Community College

I imagine it has happened to most of you, you've put in a long day in a Montana city, town or rural location far from home and then when finished, rather than stay over and head back in the morning, you take to the road before dusk with thoughts of home in your mind. What a wonderful chance to relax, and reflect!

Heading from Butte to Kalispell via Missoula recently, I had such an opportunity to enjoy the early spring countryside and mountain scenery as my way led along that infamous headwater tributary of the Clark Fork River, Silver Bow Creek. To the contemplative accompaniment of the theme from "Out of Africa," I recollected a recent article in High Country News on the Clark Fork Drainage, and its past, present and hoped-for future. A gutsy group of local citizens, the Clark Fork Coalition, are leading the fight to restore the river to a semblance of its predevelopment quality. And, of course, my mind then drifted closer to home, to the Flathead River and its watershed, and the past and ongoing efforts of maintaining and improving this impressively beautiful and important tributary of the Clark Fork.

Fortunately, at least so far, unlike the Clark Fork the Flathead has avoided industrialization. And so today, while citizens work to restore the Clark Fork, equally dedicated citizens work to keep the Flathead the quality river it is despite continuing point and nonpoint discharge concerns.

We are here today not as an isolated instance in time or a unique event, but simply as one product of efforts begun by the people - residents, citizens, stewards - of this valley to protect the physical and biological integrity of the region. But what should be more natural in our political system than citizens, lay and technical people alike, leading the charge. By its very nature and intent, central government is seldom an innovator but principally a responder.

Citizens across the country are spending their time, their money, and sometimes risking jobs and careers to call attention to our badly abused landscape. People like self-employed forester Denny Alsop, dubbed the "paddling Paul Revere," who has paddled, poled, pushed and packed his canoe from west to east across the breadth of Massachusetts to dramatize the plight of waters in the Bay State. Closer to home, national attention was focused two years ago on Flathead Lake by Paul Stelter's feat of endurance as he swam the length of Flathead Lake for the first time.

This type of activism is not new here or elsewhere. In the 1960's, Loren Kreck of Columbia Falls galvanized the successful opposition to the siting of a pulp plant at the north end of the valley. We have only to look at Missoula today to imagine our possible loss, and thank Loren and his compatriots for their actions. Loren's work was a prelude of things to come, for the decade beginning with the Arab oil embargo of 1973 was to be a period of great resource development pressures, significant scientific study, and in my mind most important, the awakening of the local citizenry to the richness of the resources of the Basin and the need to be active in protecting them.

The specter of a large open-pit coal mine on the Canadian headwaters of the North Fork of the Flathead River to supply the seemingly insatiable demand of Japanese industry, soon emerged as the major focus of local concern.

This later was joined by the possibility of major oil and gas exploration and development as massive leasing of Federal, State, and private lands took place. Citizens, and the scientific community alike, began to raise serious questions about the cumulative impacts on the terrestrial and aquatic resources of the basin by these major activities, in addition to the continuing rural residential development and agricultural and timber harvest activities. As a result, proposals were made by local scientists and land managers for a basin-wide baseline resource inventory.

But in reality it took the formation of the Flathead Coalition, galvanized by citizens such as Wayne Herman, Jim Cumming, Gene Albert, Thurman Trosper, Jim and Virginia Sloan, the ever-vigilant Loren Kreck, Jon Heberling, State Representative Ora Halverson, and others joined by dozens of local businesses, sports and conservation groups, to dramatize these issues and make them the subject of public attention. The message and objective of the Coalition was clear - "zero pollution of the Flathead and no trade-offs."

Most early scientific study in the basin had been either site or topic specific and so the authorization by Congress under Public Law 92-500 of the "208" water quality projects represented a major change in focus to basin-wide or state-wide assessments.

In retrospect for the Flathead Drainage, as possibly for many others, this work, albeit woefully short term, underfunded, and hastily organized, set the stage for later work and, particularly through the formation of local oversight boards, managed to inform and involve citizens so they could become part of this newly aroused, citizen-lead consciousness. One aspect of this awareness was a Water Quality Conference similar to today's, conducted in affiliation with the National Wildlife Federation, attended by over 300 people and held here in this room eleven years ago almost to the day.

At the State level the only direct action taken in response to local concerns about water quality issues in the Flathead was a DNRC report on potential impacts from mining at Cabin Creek. Unfortunately, appeals by Flathead Coalition members to the Governor's office and the Department of State Lands to halt leasing of State lands in the North Fork met with little success.

But members of the Coalition were persistent and finally found in now-Senator Max Baucus a person sensitive to local concerns. After numerous visits and discussions, the Congress authorized $2.9 million dollars for the Flathead River Basin Environmental Impact Study. Fortunately for us, this was to be a different study; instead of a group of outsiders, scientists, and managers descending on the Flathead, the legislation mandated a Steering Committee of local individuals with strong citizen representation to define and direct the study under the general direction and cooperation of the Environmental Protection Agency.

One particularly important result of this local control and management was that State agency and university scientists were engaged to do most of the technical studies; assuring the area of continuity with past and future work and supporting the development of local scientific expertise and facilities.

So over a several-year period, the Coalition then achieved its major goals of raising the condition of Flathead waters to an International Joint Commission initiating a basin-wide scientific baseline study, and beginning the process of bringing about integrated and coordinated land management.

During the first years of the five year study period, which ran from 1978-1983, its chair was held by a truly unique person, Leland Schoonover, "Schoonie," an arch-typical Montanan, a school teacher turned politician. Schoonie, who was a long time advocate of resource conservation, could cajole, coax, and politic with the best. He devoted the last years of his life to the successful launching of the study and it bore his mark thereafter; nonpartisan, practical, easy going in spirit but hard driving for results. Schoonie was mentor to all of us. Ever the country teacher, he felt passionately about keeping the study "the people's." After all, they had fought for it, and won it, and Congress had said it was theirs, and that's the way it was.

As an indication of Schoonie's devotion to this area and its superlative natural resources, the final report of the basin study was dedicated to him. His work and the efforts of many other citizens, scientists, and managers have resulted in a successful effort to assess and monitor the terrestrial and aquatic resource of the Flathead Basin.

But, as we all know, there is much work left to be done. Near the top of the list of twenty-six specific recommendations adopted by the Steering Committee at the conclusion of the study in 1983 was the following:

> " The Steering Committee recommends that the opportunity for public involvement are available and that public participation be encouraged regarding major land use and development decisions."

As a member of that Steering Committee, I can attest that the group clearly understood that an informed, motivated, and active citizenry was the best tool available to effect the many of the recommendations of the report and others which, although unforeseen in 1983, would certainly develop. Almost immediately, this was proven by the strong local support given to State legislation establishing the River Basin Commission. More recently, a broad coalition of dedicated individuals and groups provided the needed impetus to push the local-option phosphorus bill through the legislature and have it implemented in Flathead and Lake Counties.

In addition, local meetings of the IJC have been well attended with strong statements concerning protection of Flathead waters delivered by basin residents. Meanwhile, on the corporate front, John and Sharon Frederick have taken on parent company, Rio Algom, in a David and Goliath-like confrontation and there is the assurance that the now-dormant Flathead Coalition or other citizen groups will emerge quickly should Cabin Creek rear its ugly head again.

And so the efforts of the Freshwater Foundation and the River Basin Commission in the educational and informational areas take on a renewed importance, as evidenced by this symposium.

It seems to me, however, that the Commission, the scientific and land management community, and local citizen activists must forge a stronger, more synergistic alliance if we are to successfully address and solve some of the major efforts ahead, such as more effective land use planning, the inevitable renewal of oil and gas activity, and the continuing concerns over scattered rural development and agricultural and forestry practices.

This effort will require, I believe, a two-pronged approach: First, I feel that the educational effort initiated by the Freshwater Foundation should be given a continued life and a budget level which will allow a substantial increase in educational outreach, such as teacher workshops, classroom and field sessions for elementary, junior high, and high school students, and last but not least, an enlargement of the citizen education programs now in progress.

My second concern is that the Basin Commission as presently composed and constituted does not properly recognize, nor sufficiently emphasize, citizen efforts and a need for direct, nonpolitical, citizen representation.

I believe that, if necessary, the present legislation constituting the Commission should be amended to increase the number of citizen representatives, possibly even allowing for popular election of these citizens. Finally, and possibly most controversial, I would suggest that the Commission By-Laws provide that a citizen representative be chair.

None of these latter recommendations should be construed as an indictment of the present Commission for it has performed as intended by those who conceived it, relative to the needs they saw, and its members have contributed greatly to its successes.

Just as it was Congress' original intent to enhance the effectiveness and continuity of the study by giving its primary control to a local steering committee, so I believe it should now be apparent that in order to continue moving ahead in addressing and solving controversial issues, a coordinating board with strong, direct citizen participation is a must.

Certainly by now it is a time-tested and well understood principle that, to the extent people feel well-informed and represented, they will be empowered to act responsibly and in the best long-term interest of the community in which most have invested their lives. Just as "taxation without representation" didn't work, nor will "management without representation."

Let me remind us all that we live in a very unique state, one in which "the state and each person shall maintain and improve a clean and healthful environment in Montana for present and future generations."

Referred to by leading western legal scholar Charles Wilkinson, as the single strongest statement of conservation philosophy in the constitution of any state and very likely any nation in the world, our 1972 Constitution's Declarations of Rights states that, "All persons are born free and have certain inalienable rights including the right to a clean and healthful environment." With such rights there are clear responsibilities which we as citizens are ready, willing and able to fulfill.

And so, in keeping with the very significant progress made since the early 1970's by local citizens participating in the Flathead Coalition, the River Basin Study, and now in the Flathead Basin Commission, I would like to call for a dedication of this meeting to all those agency and academic personnel, political representatives, and private citizens, in particular Leland Schoonover, who have contributed their time and talents to a better understanding and conscientious management of this ecosystem.

"Schoonie" let us know, after all, that of his many contributions the most significant role he fulfilled, finally, was as a "citizen."

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Dr. Harry Fritz
Professor
University of Montana

From Proceedings of 1988 Symposium on Water Quality of the
Flathead River Basin, Montana

Water Quality: Status and Trends

by

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and
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INTRODUCTION

"Water quality" means different things to different people. In a regulatory sense, water quality encompasses 1) the natural characteristics of water (i.e. ambient concentrations of dissolved and particulate constituents) 2) the temporal variation of those characteristics and 3) degradation of those characteristics to the extent that use of water by humans is impaired. However, to citizens of the Flathead, water quality seems to refer to just about any aspect of water or its biota that influences the esthetic or economic quality of human experiences in relation to the lakes and streams of the basin. Most people recognize the important relation between water quality and activities that alter landscapes (e.g. dams, deforestation, urbanization) or ecological processes (e.g. fish migrations) within the basin, especially when landscape modifications are made without attempt to minimize impacts on water quality. Indeed, the Flathead River Basin may best be referred to as an ecosystem in which terrestrial, atmospheric and aquatic components and processes are dynamically linked (Stanford and Potter 1976, Zackheim and Cooper 1983). Thus, anything that quantitatively changes ecosystem integrity (i.e. structure and function) may be deemed a threat to water quality.

In this paper we summarize the status of water quality in the Flathead River Basin, provide some time-series analyses of water quality trends at key locations and review the most pressing threats. Analysis is limited to our own extensive biophysical data sets (i.e. data gathered by the Biological Station, either independently or under agency contract) and does not consider some important wildlife issues in detail, particularly those related to the basin's fisheries.

STUDY AREA

The Flathead Basin encompasses 22,241 km^2 in northwestern Montana and southeastern British Columbia (Fig. 1). The Flathead River at Flathead Lake is 6th order with a mean discharge of 350 m^3/sec. Thus, the hydrology of 496 km^2 Flathead Lake is rather dramatically influenced by riverine inputs (Stanford et al. 1983); most of the other large lakes in the basin (Fig. 1) are also influenced by inflowing streams. The limnology of the large lakes tends to reflect or integrate upstream land-use patterns. For example, all of them receive overflow turbidity plumes during spring runoff, or in association with spates, as flooding tributary streams erode their banks. The sediment plumes contain higher concentrations of plant growth nutrients than normally exist in the water column of the lakes; and, thus, the plumes tend to fertilize the lakes. A myriad of streams exists in the basin drainage network and their biophysiology is related to the particular geological landscapes that characterize a particular stream catchment. In general, streams and lakes in Glacier National Park tend to be very low in dissolved solids, owing to the relatively inert nature of the Precambrian argillite (siltite) mudstones that dominate the substrata. Conversely, streams draining the Canadian portions of the North Fork and the montane areas south of the Park incise Mesozoic limestones and are well buffered (Zackheim and Cooper 1983). Most of the water of the Flathead is derived from snowmelt in the mountains, as the valley bottoms average only about 60 cm of precipitation per year.

A remarkably diverse assemblage of aquatic insect fauna occurs in the Flathead River system, with known species of mayflies, caddisflies, and stoneflies totaling nearly 300 in the mainstem river. Each insect species displays a distinct pattern of resource use, behavioral adaptation and timing of development (particularly in response to temperature) which permits coexistence with other species at the same location. At a single sampling site on the Flathead River near Kalispell 40 species of stoneflies and over 30 species of caddisflies have been collected. An array of native and introduced fish bring the Flathead drainage total to 22 species. Bull trout (Salvelinus confluentis) and westslope cutthroat trout (Salmo clarki lewisi) are the most highly prized of the native fishes, while kokanee salmon (Oncorhynchus nerka) and lake trout (Salvelinus namaycush) are popular introduced species (Zackheim and Cooper 1983, Lenihan and Johnson 1987). Lake whitefish and yellow perch are also of increasing interest in Flathead Lake. Of the 45 million fish introduced into Glacier National Park from 1912 to 1960, most were Yellowstone cutthroat trout (Salmo clarki bouvieri), though many rainbow trout (Salmo gairdneri) were also stocked. Hybridization of native westslope cutthroat trout with these two related fishes is a major concern in efforts to maintain the indigenous fishes in the Park (Marnell et al. 1987).

Major anthropogenic features of the basin include: Kerr and Hungry Horse Dams (both are hydroelectric facilities); urban areas intermixed within the agricultural land base of the Kalispell Valley (ca. 10% of total basin area); extensive logging and road building in the forested areas not included in Glacier Park and adjacent wilderness areas; and the largely pastoral setting of the Flathead Indian Reservation. The proposed Cabin Creek coal strip mine is located in British Columbia near the North Fork (Fig. 1). There are no heavy industries in the basin that have point source discharges of pollutants; point sources of concern are apparently limited to urban sewage systems (Zackheim and Cooper 1983).

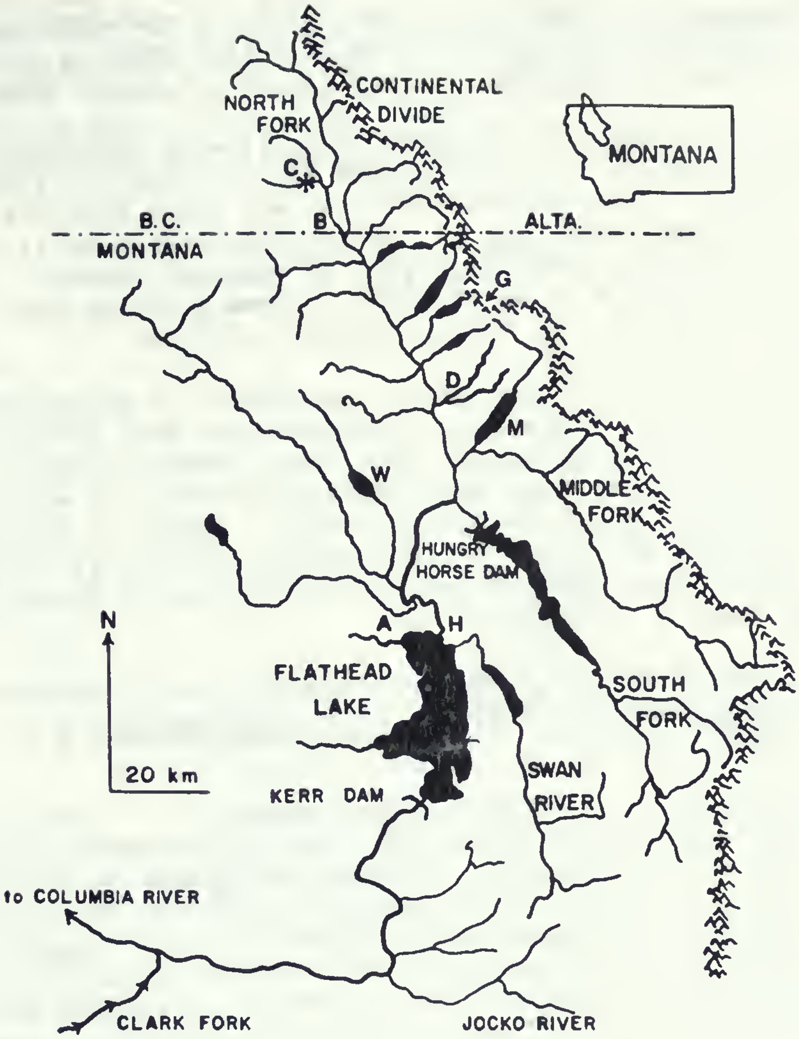

Figure 1. The Flathead River Basin showing the major tributaries contributing water to Flathead Lake and the lower Flathead River confluence with the Clark Fork of the Columbia. Locations of selected lakes and streams are shown by G (Gyrfalcon Lake), M (McDonald Lake), W (Whitefish Lake), D (Dutch Creek), C (Cabin Creek), B (north fork of the Flathead River at the border), H (Flathead River at Holt), and A (Ashley Creek). Note the site of the proposed coal mine on Cabin Creek (*).

METHODS

In this paper analyses of biophysical data were limited to key variables, which were known from previous work (e.g. Stanford et al. 1983, Zackheim and Cooper 1983) to be of critical importance to considerations of the quality of water in the basin. It was also important to provide a new synthesis of the status of the basin's water quality, and not dwell on data or relations previously reported. A plethora of other important data existed in the computer files at the Flathead Lake Biological Station, but remained to be analyzed in detail. However, most of these data were summarized in recent documents (Limnology Task Force 1986, Water Quality and Quantity Committee 1987), which contained evaluations of the potential impacts of the proposed Cabin Creek coal mine in the Canadian portion of the basin (Fig. 1).

The sites discussed in this paper (Fig. 1) were selected from an array of over 50 sites monitored by the Flathead Basin Commission (1986). These sites represent the full spectrum of streams and lakes from high in the headwaters to Flathead Lake (Fig. 1). Only sites with a multi-year data base were selected in order to permit analysis of temporal trends. These sites also illustrate a spectrum of water quality, from pristine (e.g. Gyrfalcon Lake) to highly polluted (e.g. Ashley Creek).

Data were collected in time-series and under the guidelines given in the Master Plan (FBC 1986). In general this means that grab samples (e.g. for chemical constituents) or biological data (e.g. primary production) were gathered about monthly, although the sampling frequency at most sites increased to biweekly during the spring runoff. Samples were maintained on ice or field filtered and frozen as appropriate. All analytical data reported here were generated from analyses made in the Freshwater Research Laboratory at the Flathead Lake Biological Station.

Temperature and discharge data were obtained with continuous recorders and the data transcribed from computer files archived at the U.S. Geological Survey, Reston, VA.

Analytical methods for chemical constituents (i.e. specific conductance (cond), soluble reactive phosphorus (SRP), soluble phosphorus (SP), nitrate-nitrogen (NO_3-N), ammonium-nitrogen (NH_3-N) and the ratio of total phosphorus to total nitrogen (P:N)) were as in American Public Health Administration (1985) or as modified by Stanford et al. (unpubl. manual, Flathead Lake Biological Station). Quality control criteria for rejection of analyses were: 100 ± 10% of sample spikes; and, < 1 standard deviation of the mean of replicated analyses. These checks were run on about every 10th field sample. In addition, laboratory performance evaluations were made about every 6 months, using sample standards and unknowns from the U.S. Environmental Protection Agency. Reports of these evaluations were archived at the Biological Station.

Biophysical data included time-series measurements of secchi depth, a measure of water transparency, and phytoplankton primary production, as determined by the photosynthetic uptake rates of $^{14}CO_2$ in light and dark bottles incubated in situ (Stanford et al. 1983).

All data were stored in ASCII format in the computer files at the Biological Station. SPSS-PC+ statistics software was used to examine time-series trends.

RESULTS AND DISCUSSION

Hydrographs, Thermal Patterns and Consequences of Volume Regulation

Streams and lakes of the Flathead River Basin characteristically exhibited hydrologic variation that was annually very predictable. High volume discharge occurred in the months of April - July, as snowpack in the headwaters is melted by warming temperatures; and, minimum volume occurs in December - January, as winter freeze-up eventuates. Hydrographs at all sites showed that unpredictable spates, due to intense rainfall or chinook thaws, may occur at most anytime and elevate water volume in streams and lakes. But, these tended to be short-term events, lasting a week or two, and did not alter the general pattern of spring high to midwinter low (e.g. Fig. 2).

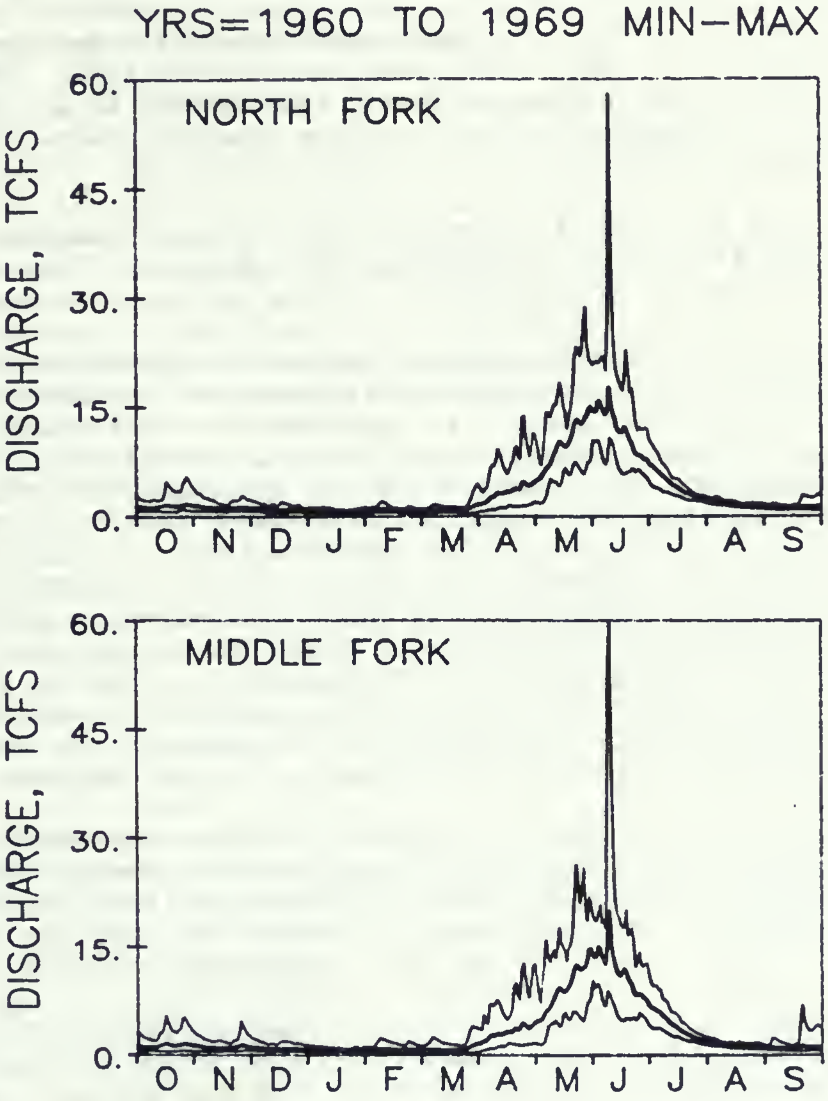

Figure 2. Maximum, minimum and mean discharge (total daily cubic feet per second) in the North Fork and Middle Fork of the Flathead River for water years 1960 through 1969.

A long term hydrologic data set exists for the Flathead. At some sites the record exceeds 90 years. The data have not been thoroughly analyzed here or in other studies (cf. Enk et al. 1985), especially with respect to global climate patterns (e.g. in response to El Nino events) or in relation to changes in land-use patterns (e.g. deforestation).

However, some important consequences of several decades of stream and lake regulation by the two dams, Kerr and Hungry Horse, were documented and are summarized here. Stream and lake level regulation has eliminated the annual amplitude of discharge in the South Fork of the Flathead River (Ward and Stanford 1979, 1982), reduced annual amplitude and dramatically increased short-term fluctuations in the mainstem Flathead River above Flathead Lake (Perry 1984) and below Kerr Dam (Cross et al. 1987), and changed the timing and duration of "full pool" in Flathead Lake (Stanford et al. 1983).

The biophysical effects of stream regulation by the dams have been documented (Perry et al. 1986, 1987, Hauer and Stanford 1982a, 1982b, 1986, Zackheim and Cooper 1983, Fraley and Graham 1982, Fraley et al. 1986) and are summarized here. Two aspects are particularly important to the present discussion of water quality.

First, it is important to understand why and how stream temperature regimes have been altered by stream regulation. Because of the inherent predictability of natural hydrographs (i.e. flow pattern, not necessarily annual yield), temperature dynamics are also predictably "seasonal" in the unregulated streams. Summer hypolimnial (bottom) discharges from Hungry Horse Dam greatly cool the riverine environments downstream; whereas, winter releases warm the water and prevent it from freezing. The overall effect is to create a more seasonally constant, but colder, thermal environment. This has greatly altered the annual heat budgets of the regulated stream reaches. Indeed, Stanford et al. (1988) demonstrated a linear relation accurately predicting annual degree days as a function of stream order (size) for the unregulated streams in the basin. They also quantified how the relationship changed as a consequence of stream regulation. For example, the thermal environment in the South Fork below Hungry Horse Dam is very much like a first-order, lowland springbrook, because temperatures from the bottom of the reservoir are very constant (in spite of short-term flow fluctuations by the hydropower operations of the dam), much like the aquifers that feed springbrooks (e.g. Roy's Creek on the Biological Station grounds).

The second point involves the response of stream organisms to the altered discharge and associated temperature regimes. Because stream biota are mostly poikilothermic (cold-blooded), their metabolic rate, and, hence, growth and reproduction, are dependent on temperature. Cooling the annual heat budget, owing to the effects of stream regulation, may stress organisms to the point that they cannot successfully complete their life cycles. Conversely, if the mode of regulation is a surface release system (e.g. as below Kerr Dam), the downstream environment may be abnormally heated during the summer (due to the heat storage effect of the lake surface); and, the resulting regime may be too warm for the natural stream biota. The bottom line is that the natural stream community is altered to the extent that the thermal regime is altered. Indeed, the South Fork below the dam contains mainly biota characteristic of a cold springbrook (Stanford et al. 1988), most of the native biota has been extirpated and biota characteristic of lower order streams have colonized. Likewise, biota in the partially regulated segments (i.e. the mainstem Flathead below the South Fork confluence are at times thermally stressed (Hauer and Stanford 1982a, Perry et al. 1987). Certainly, other impacts of stream regulation have influenced the distribution and abundance of lotic biota (e.g. dewatering of fish redds, Fraley et al. (1986); armouring of substratum, Perry (1984); alteration of quantity and quality of seston food sources, Hauer and Stanford (1982a), Valett and

Stanford (1987)). However, natural thermal regimes are fundamental to the survival of most aquatic biota, whereas, other disturbances exert secondary (but, also often stressful or lethal) effects. In this context the effects of stream regulation must be viewed as negative and a severe threat to water quality, especially since regulation regimes have and will likely continue to change erratically over time in response to variables unrelated to water quality (e.g. economics of hydropower in the Bonneville grid; recreation demands in the Lower Columbia reservoirs).

Alteration of the Flathead Lake hydrograph has exerted direct effects on water quality. Over 50 years of lake level regulation (i.e. spring flood waters are held in the lake through late fall for gradual winter release for hydropower) by Kerr Dam has completely reconfigured shoreline biophysical features, owing to shoreline erosion and elevation of the shoreline water table resulting from the abnormal temporal extension of "full pool" (Hauer et al. 1988).

Recent work by Carolyn Bauman (Flathead Lake Biological Station, M.S. thesis in preparation) has demonstrated that lake level regulation may contribute abnormal growths of algae on the shoreline; the full pool period exists long enough for a heavy periphyton biomass to accumulate and the dewatering process apparently allows oxidation of the previous year's crop, providing nutrient rich substrata for periphyton propagules to readily use and begin the cycle again upon refilling of the lake in the spring. This process may be cumulative and synergistically interactive with increasing lake fertility (Stanford et al. 1983) and probably explains why the "ring (of periphyton) around the lake" seems to shoreline residents to have increased dramatically in the last two decades. Unregulated lakes in the basin (e.g. Whitefish, McDonald, Gyrfalcon) fill to full pool during spring runoff, but decline quickly to an equilibrium shoreline; the abnormal periphyton community, described here for Flathead Lake, either has no time to develop or is more nutrient limited (or both). All of our lakes have characteristic, natural periphyton communities. Indeed, the shoreline of ultraoligotrophic Gyrfalcon Lake is matted with Cladophora gyrfalconium, a rare green alga adapted to high light and extreme nutrient limitation (Stanford and Prescott 1988). However, it grows very slowly and, in this unique case, must be viewed as an indicator of extremely good water quality.

Turbidity within the water column of Flathead Lake, caused by lakeward transport of shoreline soils eroded by wave action during storm periods, was documented (Lorang and Stanford 1988) and reflects deteriorating water quality as a direct consequence of lake level regulation. Indeed, the shoreline is being eroded at an annual rate that varies from a few cm in protected bays and rocky areas to 3 - 5 m on shorelines with soil profiles exposed to wave impact (e.g. the Bigfork side of the north shore, Hauer et al. 1988). Soils transported into the lake by the erosion process, like river flood waters, contain elevated nutrient concentrations. This source of nutrients is insignificant in terms of the lakewide nutrient budgets (Lorang and Stanford 1988), but probably explains in part why previous studies (Stanford et al. 1983) showed greater phytoplankton productivity nearshore than at midlake. Wave caused erosion is not a problem in the natural lakes of the basin, as they have had hundreds of years to equilibrate with the annual variation in the hydrograph.

Chemical Constituents of Streams and Lakes

If lakes and streams selected for long term monitoring of chemical variables are indicative of the basin waters as a whole, and a myriad of monitoring data from other basin waters suggest they are (Zackheim and Cooper 1983, Stanford, unpubl.), water quality in the basin is in general very good (Tables 1 and 2). This is of course no surprise, since the majority of waters descend from Glacier National Park and various wilderness areas. Indeed, Gyrfalcon and McDonald Lakes and Dutch Creek are on par with the world's cleanest waters (Stanford and Prescott 1988) and the other sites are way above the national norm. However, Ashley Creek is obviously an exception (Table 2), as a consequence of the point source nutrient loads it receives from the Kalispell sewage treatment plant. The nutrient pollution in the sewage effluent is so severe that toxic concentrations of ammonia and oxygen-consuming organic compounds have been routinely recorded.

A subtle water quality concern is reflected in these data (Tables 1 and 2), however. Note that the North Fork of the Flathead River at the Canadian border and Cabin Creek have higher SRP and lower nitrate concentrations than elsewhere in the basin (except, of course, in Ashley Creek). Correspondingly, P:N varies from near equality in Cabin Creek to 1:.100 in Lake McDonald in GNP. Obviously, there are sources of phosphorus in the geology upstream of the Canada-US border that do not exist generally in the basin and nitrate is scarce by comparison. The phosphorus loading effect is diluted by phosphorus-poor waters downstream of the border and nitrate values increase. These data suggest that North Fork waters in Canada may be nitrogen limited in terms of their ability to produce plant biomass; whereas, waters downstream become progressively more phosphorus limited. Recent bioassay data (C. N. Spencer, Flathead Lake Biological Station, unpubl.) suggests that phytoplankton productivity in Flathead Lake may be limited by both nitrogen and phosphorus (see below). This is of extreme importance, because one obvious impact of the proposed Cabin Creek coal mine will be that nitrogen concentrations will increase several orders of magnitude in waters draining the mine site (Mine Development Committee 1986). Blasting compounds used in the mining process would be the culprit. Since the exact concentrations that may eventuate are not known and no predictive models exist, one can only guess how far downstream the impact of increasing nitrogen fertility may extend. One study concluded that the effects on Flathead Lake would be minimal (Limnology Task Force 1986). But, clearly waters of the North Fork some distance downstream from the border would be degraded (Biological Resources Committee 1987). One likely consequence of this fertilization would be that periphyton production would be dramatically increased. Since the waters in question are part of the Glacier - Waterton Parks International Biosphere Reserve, such an impact on water quality should be met with disdain and be subjected to careful, quantitative study.

Biophysical Trends in Flathead Lake

The limnology of Flathead Lake has been under continuous study since 1977 and by 1984 it was concluded that the lake was showing early signs of eutrophication from nutrient pollution, mainly from urban sewage (Stanford et al. 1983, Zackheim and Cooper 1983). In response to these concerns, the lake is a focal point for water quality monitoring. One reason for the monitoring effort was to determine if water quality in the lake is changing, especially in response to upgraded sewage treatment plants in the urban centers, basin-wide ban on sale of phosphorus containing detergents and increasing emphasis on "best management practices" for timber harvest and agriculture in the basin (Montana Department of Health and Environmental Sciences 1984, Bahls 1986, FBC 1986).

Table 1. Mean conductivity (umhos/cm), nutrient concentration (ug/l) and ratio of total phosphorus to total nitrogen for selected lakes of the Flathead River Basin shown in Figure 1. Ranges are given in parentheses.

Site	Cond	SRP	SP	NO_3-N	NH_3-N	P:N	n (yr)
Gyrfalcon	30.3 (19-42)	<1 (<1-<1)	1.6 (<1-2.7)	23.4 (<10-85)	<5 (<5-13)	1:28	14 (6)
McDonald	95 (74-117)	<1 (<1-<1)	<1 (<1-<1)	152.0 (128-164)	<5 (<5-<5)	1:103	8 (4)
Whitefish	151 (138-164)	<1 (<1-<1)	3.7 (2.6-4.2)	20.8 (20-60)	5.1 (<5-6)	1:17	60(2)
Flathead	166 (156-177)	<1 (0.1-1)	4.5 (2-20)	38.4 (5-136)	5.6 (<5-12)	1:17	564(10)

Table 2. Mean conductivity (umhos/cm), nutrient concentration (ug/l) and ratio of total phosphorus to total nitrogen for selected streams of the Flathead River Basin shown in Figure 1. Ranges are given in parentheses.

Site	Cond	SRP	SP	NO_3-N	NH_3-N	P:N	n (yr)
Dutch	20 (10-35)	<1 (<1-<1)	4.0 (<1-5.5)	122 (32-300)	<5 (<5-<5)	1:>100	5 (3)
Cabin	198 (169-266)	10.6 (5-16)	12.8 (9-20)	15.3 (10- 44)	5 (<5-5)	1:<2	15(2)
North FK Border	213 (158-258)	1.8 (<1-7.9)	4.8 (<1-14)	17.2 (2-68)	6.8 (<5-32)	1:<4	106(5)
Flathead Holt	171 (141-189)	1.5 (<1-7.6)	6.2 (<1-11.0)	65.3 (10-142)	8.9 (<5-48)	1:10	127(10)
Ashley	362 (249-498)	452.3 (3-1970)	440.1 (17-2005)	860.0 (33-2641)	435.0 (18-1918)	1:6	55(4)

Of the many biophysical variables examined to date (e.g. nutrient concentrations, nutrient loading rates, temperature regimes, phytoplankton crops), most do not exhibit statistically significant trends; interannual variation is greater than the slope of the trend line, in most cases. But, there were two notable exceptions.

First, secchi depth has increased over the period of record, 1977 - 1988 (Fig. 3). This suggests the water column contains less suspended solids. The data clearly show the reduction of water clarity during the overflow turbidity period in the spring (note the recurring minimum values in Fig. 3). Turbid waters occurred less frequently in the more recent half of the record, corresponding to the generally lower water yield from the drainage basin during spring runoff of those years (i.e. 1983 -1987). Thus, these data may reflect drier years when the river system delivered lower amounts of suspended solids to the lake; these data do not necessarily mean that water clarity improved as a result of changes in the phytoplankton community. Indeed, the phytoplankton data do not suggest any major changes, other than the lakewide bloom of the pollution alga, Anabaena flos-aquae, previously reported for the summer of 1983 (Stanford et al. 1983). Although Anabaena was present every summer in very low numbers, the bloom of 1983 did not reoccur.

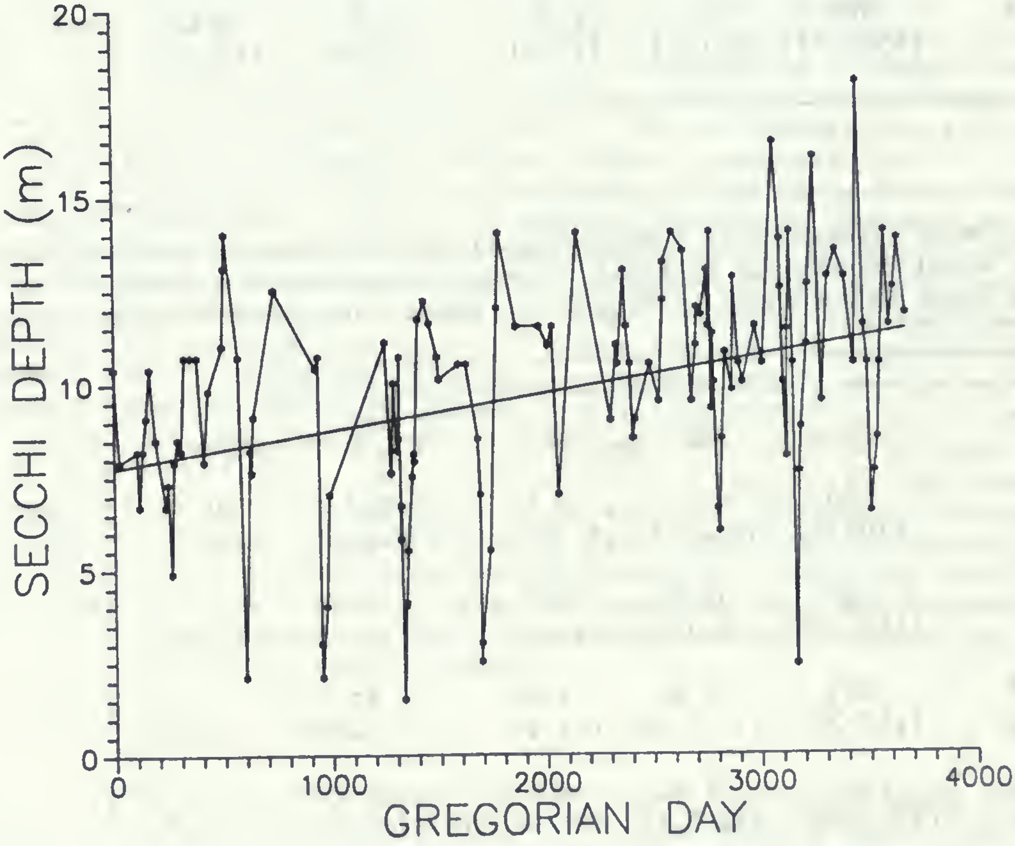

Figure 3. Secchi disk depth (m) from April 1978 through September 1987 at the midlake deep site in Flathead Lake. Linear regression of the data is indicated by the best fit line.

The second trend of importance was increasing phytoplankton primary production (Fig. 4). The trend is statistically significant only because of the 1987 value, the highest annual production measure for the period of record. Moreover, only 5 data points representing 5 annual productivity estimates (i.e. each datum summarizes a minimum of 12 monthly values) were available. This trend may also be related to the generally drier years late in the record, among other things (e.g. dynamics of discharges from Hungry Horse Reservoir, which may influence delivery of nutrients to the lake and thus also influence primary production). In any case the trend is not steep; the change during the period of record amounted to about 6%.

One cannot draw major conclusions from these trends. But, water quality in the lake seems to remain on a nutrient threshold as concluded by Stanford et al. 1983 (see also Bahls 1986); additional pollution from any source, coupled with the right limnological conditions in the lake (e.g. warm temperatures, extended periods of calm weather), could again stimulate lakewide blooms of Anabaena.

No evidence exists that nitrogen or phosphorus loading (i.e. elemental mass of N and P per unit volume of water reaching Flathead Lake) has increased significantly in the last half decade, nor do the data suggest that amounts reaching Flathead Lake from the catchment have decreased. Indeed, annual loading values for the period 1977 - 1987 did not deviate significantly ($P > 0.10$) from mean values for the period (Fig. 5). However, important progress has been made within the basin to reduce the loads from some of the sewage treatment plants (STPs). Several of the smaller urban areas (e.g. Bigfork, Lakeside) have upgraded STPs to allow nutrient removal, especially phosphorus. Moreover, the ban on sale of phosphorus-containing detergents in Lake and Flathead Counties seems to be effective (Fig. 6). But, in spite of lower phosphorus concentrations in sewage effluent from the Kalispell STP, owing to decreased detergent phosphorus (Fig. 6), Ashley Creek data do not indicate any improvement ($P > 0.01$) in the nutrient contamination problem illustrated in Table 2. This is probably because so much phosphorus is stored in the creek's sediments. The P ban is helping; but, phosphorus concentrations in the effluent remain more than an order of magnitude higher than the 0.1 mg/l that is easily achievable in modern STPs. Clearly, the Kalispell STP needs to be rebuilt to include technology for reducing nutrient content of its effluent, for the benefit of water quality in Ashley Creek (see also Dutton 1987) and Flathead Lake.

Progress toward reaching an effective and basin-wide nutrient control program, as is being implemented by the State's Water Quality Bureau (Montana Department of Health and Environmental Sciences 1984), is encouraging. If other sources of nutrients, particularly air pollution and sediments from non-point origins (e.g. wood burning and erosion associated with canopy removal and lake lake level manipulation), do not offset reductions in nutrient loads from the STPs, future data should demonstrate a decline in nutrients reaching Flathead Lake. The monitoring program of the FBC is vital in this regard.

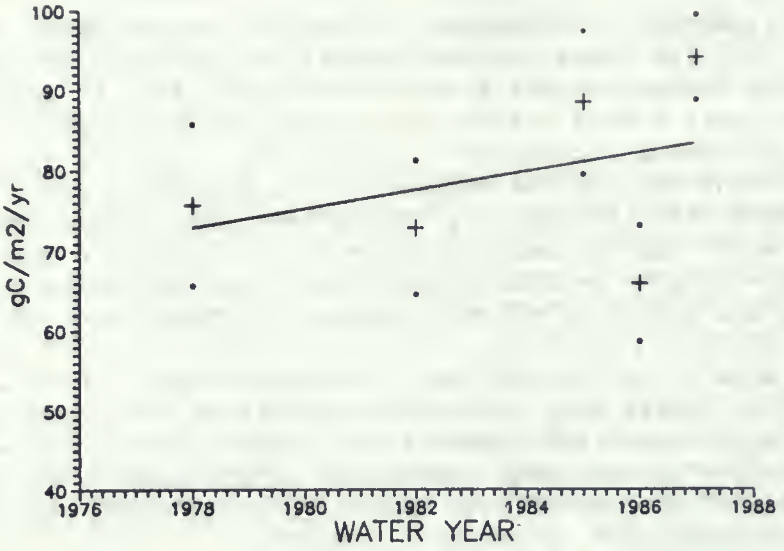

Figure 4. Annual primary production estimates (gC/m^2/yr) determined from biweekly to monthly duplicate water column profiles (0-30m) at the midlake site in Flathead Lake. The mean of the minimum and maximum estimates is indicated by the cross and a linear regression of the data is represented by the best fit line.

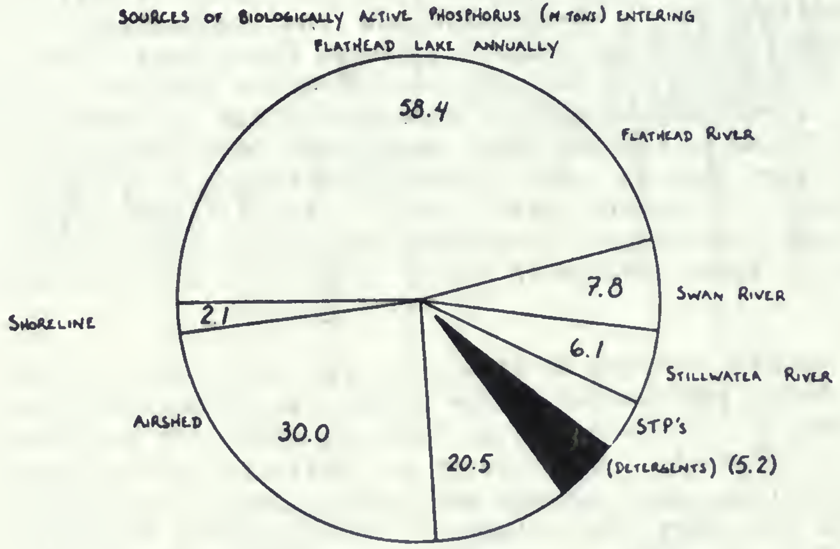

Figure 5. Annual input of biologically available phosphorus (metric tons) to Flathead Lake from the major tributaries, the airshed, sewage treatment plants, and shoreline erosion and septic systems.

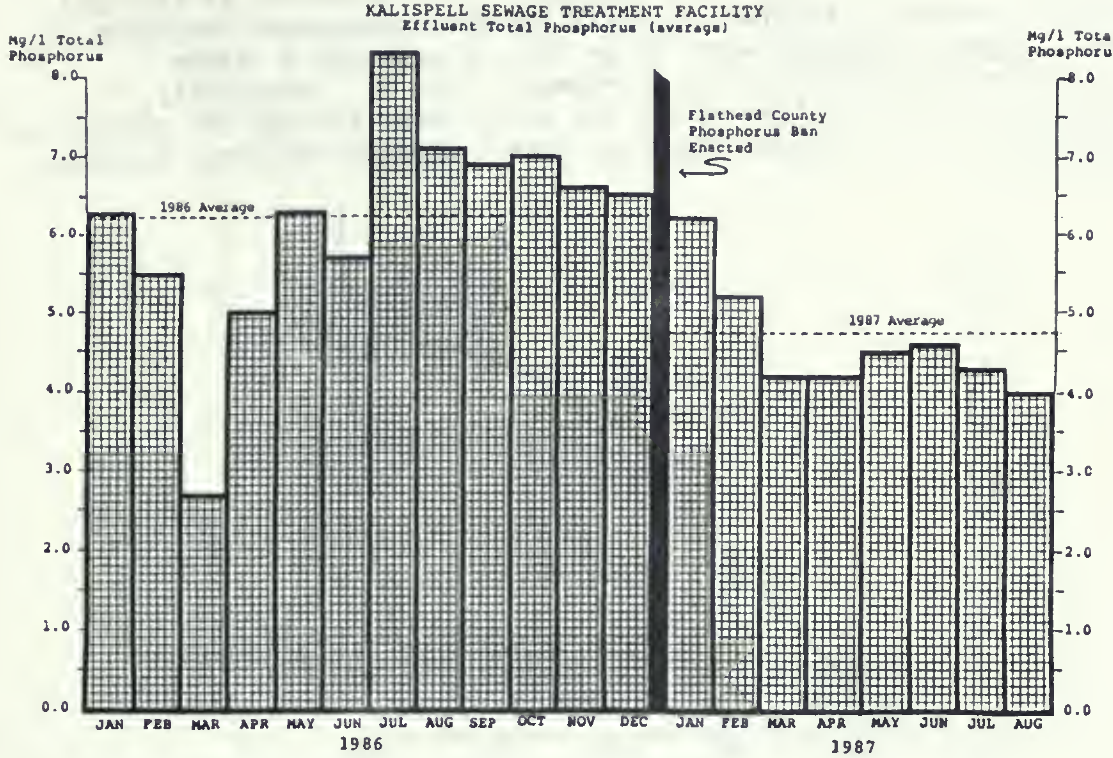

Figure 6. Average total phosphorus concentrations (mg/l) of the Kalispell Sewage Treatment Plant effluent before and after the Flathead County phosphorus detergent ban was enacted. Figure provided by Don Hultgren, Kalispell Sewage Treatment Plant.

Changes in the Food Web of Flathead Lake

During the period, 1977 - 1987, the food web of Flathead Lake changed dramatically, owing primarily to the establishment of the opossum shrimp, *Mysis relicta*. Prior to 1980 mycids were not present and the zooplankton community was characterized by abundant, large cladocerans or water fleas (Potter 1978). These cladoceran zooplankton were the primary food items for the pelagic fishes of the lake, of which kokanee salmon (*Oncorhynchus nerka*) were particularly important. In the late 1970's opossum shrimp were introduced into Whitefish and Swan Lakes (Fig. 1) from their native habitat in Waterton Lake on the Alberta - Montana border by the Montana Department of Fish, Wildlife and Parks in an effort to provide a better forage for lake trout (*Salvelinus namaycush*; see Bukantis 1987). *Mysis* apparently moved downstream to infest Flathead Lake and by 1983 were present in sufficient numbers to be quantified. The population expanded rapidly on an areal basis, but has now begun to stabilize at about 100 individuals per m^2. (Fig. 7). Since *Mysis* is known as a voracious predator of water fleas (cf. Lasenby et al. 1986), it should not be surprising that the cladoceran fauna of Flathead Lake has been decimated (e.g. Fig. 8). Large, slow-swimming species, like *Daphnia longiremis* and *Leptodora kindtii*, have apparently been extirpated, as none have been present in samples since 1986. In Waterton and other lakes where *Mysis* is native, the zooplankton community is dominated by small and very mobile forms (e.g. Copepoda and Rotifera). The situation in Flathead Lake is rapidly becoming similar, although the only cladoceran remaining in any numbers, *Daphnia thorata*, seems to be able to maintain a viable population above the thermocline in mid-summer (Fig. 9). Apparently, the mycids prefer to feed in colder waters and do not pass through the thermocline in large numbers (C. N. Spencer, Flathead Lake Biological Station, personal communication).

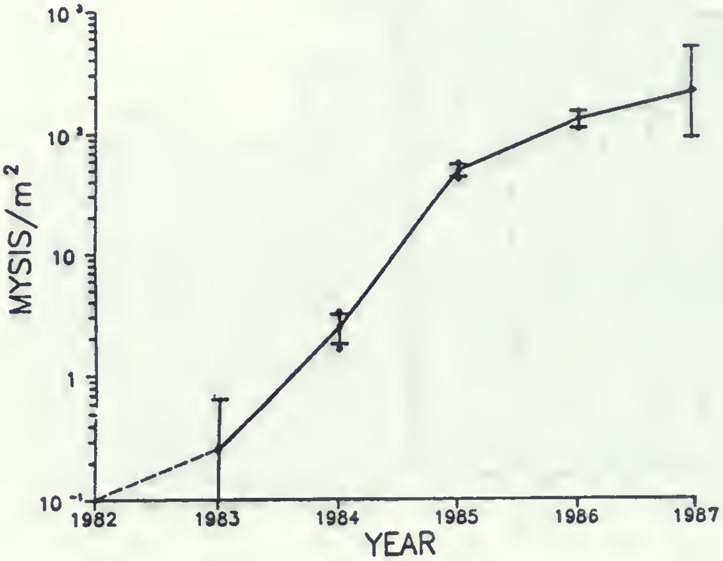

Figure 7. Density of *Mysis relicta* (organisms/m^2) in Flathead Lake. Annual mean values obtained from a lakewide census in the fall of each year; bars represent 95% confidence intervals.

Since the larger zooplankters in the lake have been eliminated, it may be inferred that the larger phytoplankton (algae) should be able to expand their populations owing to less grazing pressure. The presence of more, large algae in the water column should reduce water clarity; secchi disk readings, for example, should decrease (Kitchell and Carpenter 1987). This rationale is supported by data from Lake Michigan, although the cause - effect is opposite. The water column in Lake Michigan, which is very comparable to Flathead Lake in terms of nutrient content and primary productivity, became clearer (i.e secchi disk readings increased significantly) after introduced chinook salmon reduced the population size of alewife (*Alosa pseudoharengus*). The alewife had been a voracious predator on the larger zooplankton; when the predation pressure was removed by the salmon, the water column was grazed clear by the zooplankton (Scavia et al. 1986). However, secchi disk readings in Flathead Lake have increased (Fig. 3) and recent bioassay data suggest that the phytoplankton in Flathead Lake are controlled more by bioavailability of nitrogen and phosphorus than grazing pressure (C. N. Spencer, Flathead Lake Biological Station, personal communication). Regeneration of bioavailable nutrients is in part controlled by the zooplankton community (e.g. through excretion of labile forms of N and P) and the elimination of major portions of the community does have ecosystem-level ramifications on lakewide primary production (Fig. 10). Careful research will be needed to determine the effects of the *Mysis* invasion on the smaller components of the food web.

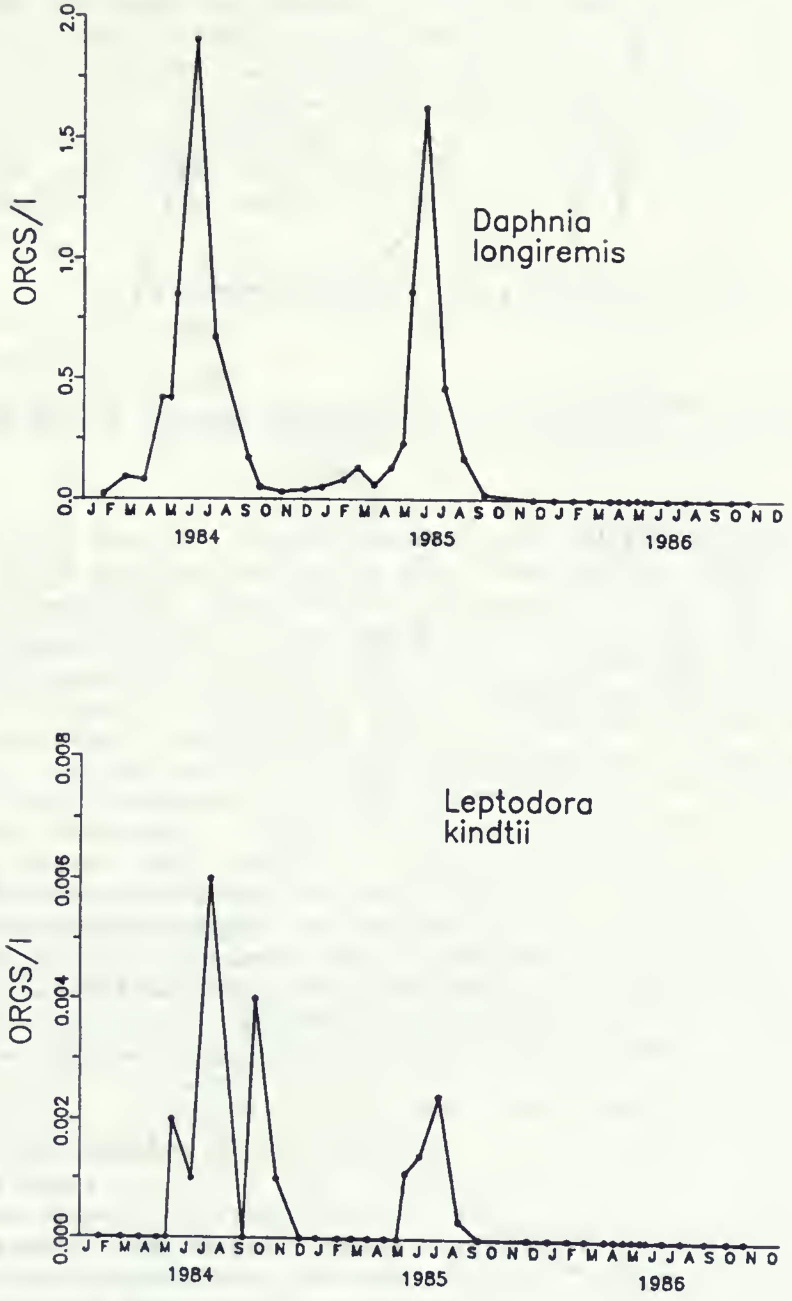

Figure 8. Mean densities (organisms/liter) of Daphnia longiremis and Leptodora kindtii at the midlake deep site in Flathead Lake, 1984-1986.

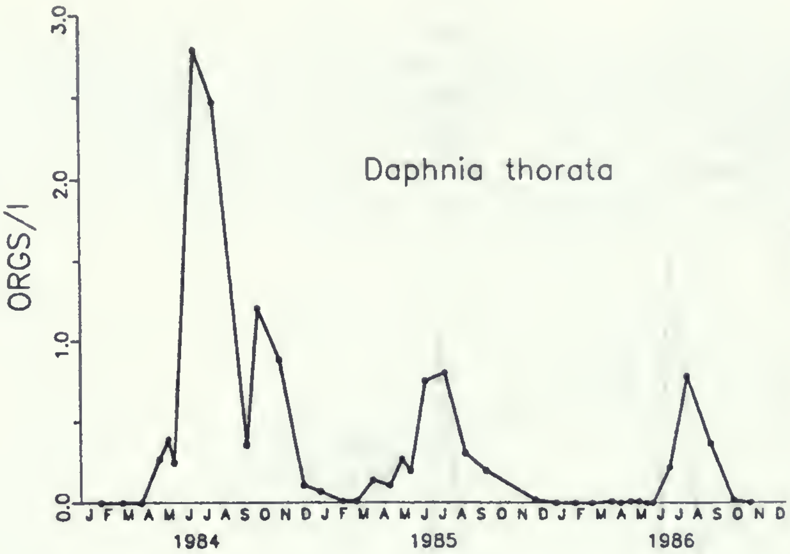

Figure 9. Mean density (organisms/liter) of *Daphnia thorata* at the midlake deep site in Flathead Lake, 1984-1986.

The effect on fishes may be more straightforward. Fishes that can eat *Mysis* should do very well. For example lake whitefish and lake trout were introduced into Flathead Lake from Canadian Shield lakes, where they evolved with *Mysis*; they are natural predators of *Mysis* because, like the mycids, they prefer to reside deep in the water column, rising out of the depths only during the colder months to feed. *Mysis* feeds on zooplankton within the water column at night and rests on the bottom during the daytime; therefore, *Mysis* is essentially unavailable as forage for surface-dwelling, pelagic fishes. Kokanee salmon are exclusively surface-dwelling and, throughout their life cycle they depend on the same food resources as *Mysis*. Since the mycids are more efficient feeders, the kokanee may starve. Indeed, 1987 spawning runs of kokanee from Flathead Lake were at an all-time low, since they were introduced into the lake over 50 years ago. Other factors than *Mysis* were involved in the kokanee decline, particularly lake and stream regulation by the dams (which dewatered redds: Fraley and Decker-Hess 1987) and overharvest by fishermen (James Vashro, Montana Department of Fish, Wildlife and Parks, personal communication). However, the presence of *Mysis* seriously compromises recovery of the kokanee fishery, based on experience elsewhere (Lasenby et al. 1986). The effect of the changing food web on other fishes is uncertain. However, bull trout live fairly deep in the water column and may benefit from presence of *Mysis* as food. But, bull trout and lake trout are largely piscivores and preferred kokanee as forage in Flathead Lake (Leathe and Graham 1982); one *Mysis* does not a kokanee make in terms of calories. Unless some other forage fish (perhaps pygmy whitefish) becomes more abundant by taking advantage of the rich *Mysis* food base, piscivores such as bull and lake trout may be food limited in the future and not reach trophy size as they have in the past.

In terms of water quality, the changing food web must be viewed as a negative impact. Clearly, the mechanisms of energy and nutrient transfer have been altered in Flathead Lake (Fig. 10). Introductions of exotic species is now recognized as abhorrent; Moyle et al. (1986) refer to its uncertain, but almost always negative, ramifications as the Frankenstein Effect. An alternative to the popular kokanee fishery should not be sought in the form of some new introduction. Moreover, resurrection of the kokanee fishery through stocking programs seems doubtful; the lake will support only a given amount of fish biomass, given its trophic status (production potential), and _Mysis_ clearly has the edge over kokanee in sequestering available nutrients. Allowing the lake to become more fertile, would negate efforts to maintain concentrations of other water quality variables (e.g. algae biomass) below acceptable levels. The food web will stabilize over time; the leveling of the population growth curve of _Mysis_ (Fig. 7) suggests such is occurring already. In time and with proper monitoring the long range implications of the food web alteration will become apparent.

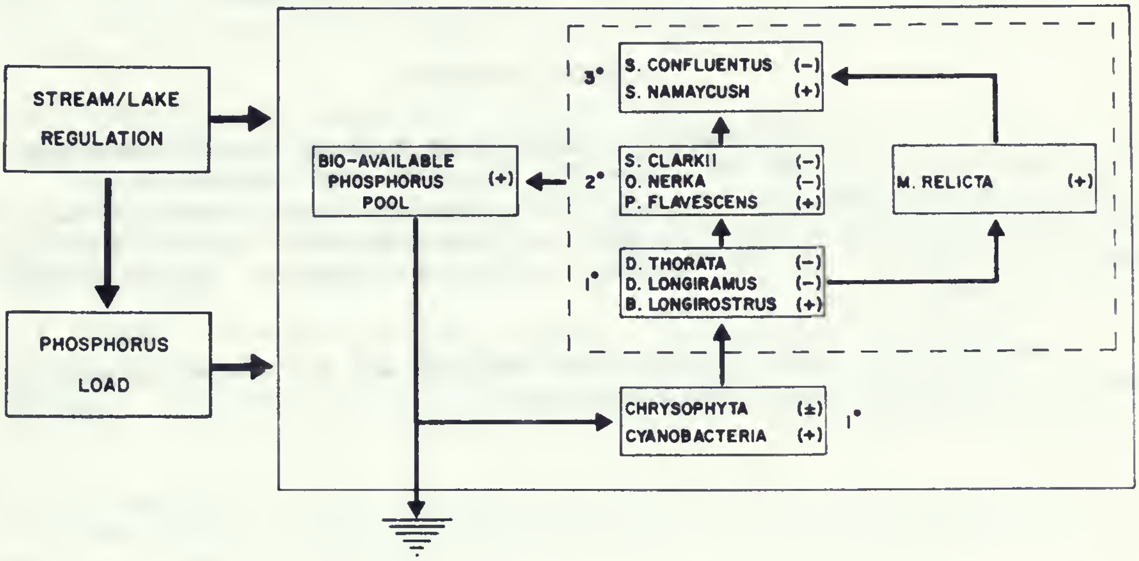

Figure 10. Conceptualization of selected biophysical interactions occurring in Flathead Lake, Montana. Stream regulation and phosphorus loading are viewed as interacting, external variables that control phosphorus flux through producer (solid box) and consumer (broken box) components of the pelagic community. The + or - designations indicate how components may be affected in the future, given present water quality trends.

Interactive threats to water quality

Water resources, including all fish, wildlife and water quality concerns, should be managed with the ecosystem as a whole in mind (Cross 1987). Indeed, the threats to water quality are interactive; management options for one resource component may compromise management objectives for others. Moreover, no resource components should necessarily have priority over others (e.g. fisheries objectives may be of equal importance to nutrient control objectives). The Flathead Basin Commission seems to play a pivotal role in coordinating the management options that will be responsive to the interactive processes that collectively compose the quality of water in the basin. Such coordination requires more complete understanding of the biogeochemistry of the system. This understanding must be translated in lay terms to the public at large. Symposia such as this one are vitally important in that regard.

The present threats to water quality seem to us to center around 1) regulation of water flow by Kerr and Hungry Horse Dams 2) abnormal nutrient (N and P) loading, and 3) alterations of the food web by *Mysis* and other exotic species for which there is very little scientific information (e.g. pelagic populations of yellow perch (*Perca flavecens*) in Flathead Lake and crayfish (*Orchonectes virilis*) throughout the basin). None of these problems can be solved without considering ramifications of the others. For this reason all water quality issues should be publicly debated and management decisions based on thorough scientific understanding. Otherwise, the present high quality of the Flathead waters will certainly be further compromised.

ACKNOWLEDGEMENTS

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LITERATURE CITED

American Public Health Association. 1985. Standard Methods for the Examination of Water and Wastewater. 16th ed. Washington, D. C. 1268 pp.

Bahls, L. L. 1986. Flathead Lake's midlife crisis. Montana Outdoors 17(4):18-22.

Bukantis, R. T. and J. G. Bukantis. 1987. Mandibles. Montana Outdoors 18(4):15-17.

Biotic Resources Committee. 1987. Technical Report. Prepared for Flathead River International Study Board, International Joint Commission. Vancouver, B. C.

Cross, D. 1987. An opportunity for integrated management of the Flathead River-Lake ecosystem, Montana. Fisheries 12(2):17-22.

Cross, D., J. DosSantos, J. Darling and I. Waite. 1987. Lower Flathead system fisheries study - draft final report. Bonneville Power Administration, Portland, Oregon.

Dutton, B. 1987. Living with Ashley Creek; streambank management and nonpoint pollution in the Ashley Creek drainage, Flathead County, Montana. Flathead Conservation District and the Montana Water Quality Bureau.

Enk, M., W. Page and L. Hill. 1985. Water and fisheries monitoring on the Flathead National Forest: Preliminary interpretation. Flathead National Forest, Kalispell, MT.

Flathead Basin Commission, Biennial Report. 1986. Governor's Office, FBC, Helena, MT.

Fraley, J. J. and J. Decker-Hess. 1987. Effects of stream and lake regulation on reproductive success of kokanee in the Flathead River system, Montana, U.S.A. Regulated Rivers: Res. Manage. 1:257-265.

Fraley, J. J. and P. J. Graham. 1982. The impact of Hungry Horse Dam on the fishery of the Flathead River - final report. U.S. Bureau of Reclamation, Boise, ID.

Fraley, J. J., S. L. McMullin and P. J. Graham. 1986. Effects of hydroelectric operation on the kokanee population in the Flathead River System, Montana. North Am. J. Fish. Manage. 6:560-568.

Hauer, F. R., M. S. Lorang, J. H. Jourdonnais, J. A. Stanford and E. Schuyler. 1988. The effects of water regulation on the shoreline ecology of Flathead Lake, Montana. Open file report. Flathead Lake Biological Station, University of Montana, Polson, MT.

Hauer, F. R. and J. A. Stanford. 1982a. Ecological responses of hydropsychid caddisflies to stream regulation. Can. J. Fish. Aquat. Sci. 39(9):1235-1242.

Hauer, F. R. and J. A. Stanford. 1982b. Bionomics of Dicosmoecus gilvipes (Hagen) (Trichoptera: Limnephilidae) in a large montane river. Am. Midl. Nat. 108(1):81-87.

Hauer, F. R. and J. A. Stanford. 1986. Ecology and coexistence of two functionally independent species of Brachycentrus (Trichoptera) in a Rocky Mountain river. Can. J. Zool. 64:1469-1474.

Kitchell, J. F. and S. R. Carpenter. 1987. Piscivores, planktivores, fossils and phorbins, pp. 132-146. IN: Kerfoot, W. C. and A. Sih (eds.), Predation: Direct and Indirect Impacts on Aquatic Communities. Univ. Press of New England, Hanover, NH.

Lasenby, D. C., T. G. Northcote and M. Furst. 1986. Theory, practice and effects of Mysis relicta introductions to North American and Scandinavian Lakes. Can. J. Fish. Aquat. Sci. 43:1277-1284.

Leathe, S. A. and P. J. Graham. 1982. Flathead Lake fish food habits study - final report. Environmental Protection Agency, Denver, CO.

Lenihan, M. L. and M. C. Johnson. 1987. Flathead Lake Issues. Montana Business Quarterly 25(2):2-7.

Limnology Task Force Report on Flathead Lake, Mt. 1986. Prepared for Flathead River International Study Board, International Joint Commission, Vancouver, B. C.

Lorang, M. S. and J. A. Stanford. 1988. Causes and consequences of nearshore sediment resuspension on the north shore of Flathead Lake. Open file report. Flathead Lake Biological Station, University of Montana, Polson, MT.

Marnell, L. F., R. J. Behnke, and F. W. Allendorf. 1987. Genetic identification of cutthroat trout, Salmo clarki in Glacier National Park, Montana. Can. J. Fish. Aquat. Sci. 44:1820-1829.

Mine Development Committee. 1986. Technical Report. Prepared for Flathead River International Study Board, International Joint Commission. Vancouver, B. C.

Montana Department of Health and Environmental Sciences. 1984. Stategy for limiting phosphorus in Flathead Lake. Open File Report. Water Quality Bureau, Helena, MT.

Moyle, P. B., H. W. Li, and B. A. Barton. 1986. The Frankenstein Effect: impact of introduced fishes on native fishes in North America, pp. 415-426. IN: Stroud, R. H. (ed.), Fish Culture in Fisheries Management. Fish Cult. Sect., Amer. Fish. Soc., Bethesda, MD.

Perry, S. A. 1984. Comparative ecology of benthic communities in natural and regulated areas of the Flathead and Kootenai Rivers, Montana. Ph.D. dissertation. North Texas State University, Denton, TX. 359 pp.

Perry, S. A., W. B. Perry and J. A. Stanford. 1986. Effects of stream regulation on density, growth and emergence of two mayflies (Ephemeroptera: Ephemerellidae) and a caddisfly (Trichoptera: Hydropsychidae) in two Rocky Mountain rivers (U.S.A.). Can. J. Zool. 64:656-666.

Perry, S. A., W. B. Perry and J. A. Stanford. 1987. Effects of thermal regime on size, growth rates and emergence of two species of stoneflies (Plecoptera: Taeniopterygidae, Pteronarcyidae) in the Flathead River, Montana. American Midland Naturalist 117(1):83-93.

Potter, D. S. 1978. The zooplankton of Flathead Lake: An historical review with suggestions for continuing lake resource management. Ph.D. dissertation. University of Montana, Missoula. 371 pp.

Scavia, D., G. L. Fahnenstiel, M. S. Evans, D. J. Jude and J. T. Lehman. 1986. Influence of salmonid predation and weather on long-term water quality trends in Lake Michigan. Can. J. Fish. Aquat. Sci. 43(2):435-443.

Stanford, J. A., F. R. Hauer and J. V. Ward. 1988. Serial discontinuity in a large river system. Verh. Internat. Verein. Limnol. (in press).

Stanford, J. A. and D. S. Potter. 1976. The Flathead Lake-River ecosystem: A perspective, pp. 241-250. IN: Soltero, R. (ed.), Proceedings of ESA Symposium on Aquatic and Terrestrial Research in the Pacific Northwest. Cheney, WA. 397 pp.

Stanford, J. A. and G. W. Prescott. 1988. Limnological features of a remote alpine lake in Montana, including a new species of Cladophora (Chlorophyta). J. N. Am. Benthol. Soc. 7(2):140-151.

Stanford, J. A., T. J. Stuart and B. K. Ellis. 1983. Limnology of Flathead Lake. Final report. Flathead River Basin Environmental Impact Study. U.S. Environmental Protection Agency. Helena, MT.

Stanford, J. A. and J. V. Ward. 1987. Consequences of stream regulation in the Columbia River, USA and Canada. IN: Craig, J. F. and B. Kemper (eds.), Proceedings of 3rd International Symposium on Regulated Streams. Plenum Press, New York.

Valett, H. M. and J. A. Stanford. 1987. Food quality and hydropsychid caddisfly density in a lake outlet stream in Glacier National Park, Montana (USA). Can. J. Fish. Aquat. Sci. 44:77-82.

Ward, J. V. and J. A. Stanford. 1979. Ecological factors controlling stream zoobenthos with emphasis on thermal modification of regulated streams, pp. 35-56. IN: Ward, J. V. and J. A. Stanford (eds.), The Ecology of Regulated Streams. Plenum Press, New York. 398 pp.

Ward, J. V. and J. A. Stanford. 1982. Effects of reduced and perturbated flow below dams on fish food organisms in Rocky Mountain trout streams, pp. 493-501. IN: Grover, J. H. (ed.), Allocation of Fishery Resources. FAO, Rome.

Water Quality and Quantity Committee. 1987. Technical Report. Prepared for Flathead River International Study Board, International Joint Commission. Vancouver, B. C.

Zackheim, H. and R. Cooper. 1983. Final report of the Flathead River Basin Environmental Impact Study, 1978-1983. U.S. Environmental Protection Agency, Helena, MT.

WATER QUALITY: PROBLEMS AND STRATEGIES

STEVE PILCHER

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I will be the first to admit that I am little bit humbled and feel a little bit out of place at a podium with the class of individuals that we have participating here today. I look around the table here and see people like Gil, Lex, the past mayor of Missoula, and past Lt. Governor, Chief Justice of the State Supreme Court and then the director of the Biological Station here who, according to people in this part of the country, has the ability to either walk on water or part-the-seas to collect samples. This guy knows everything there is to know about the lake. So, I am a little bit humbled by being here, but I do appreciate the opportunity.

Having been involved in water quality issues in this area for a number of years, it's very obvious to me that the people participating in this symposium (both from the speaker standpoint and also from the audience standpoint) are the people who continue to hold the key to the future of water quality in the drainage basin. They are the people who deserve a pat on the back for what has been accomplished to date, to deal with the threats to basin water quality, for not sitting back and watching things go to hell and then blaming everyone else for what happened. But for dealing with the problem up-front and in a very honest and effective manner. These are the same people that can continue to carry through with many of the efforts that are currently underway and are necessary to insure that this valuable natural resource receives both the recognition and the protection that I think it deserves.

The turn out today is no surprise to me. I know how important water quality issues are in this particular area. If you don't think so, just propose to discharge the effluent from the Kalispell Wastewater Treatment Plant directly to the Flathead River and see what happens. Good Luck! This is one area in Montana, where we seldom have to worry about public participation and public interest. Apathy is in no ones dictionary around here - they turn out.

Of course, having the largest, natural, freshwater lake in the western U.S. does help generate a little bit of interest. It is something for which we should not only be proud, but something for which we should feel a certain responsibility to ensure that it is there for future generations to enjoy in the same way that we have become accustomed to enjoying it. That use and enjoyment is not, however, without its costs.

Dr. Stanford has briefed us on the status of the Lake system. I think his report is encouraging but it is no time to relax. His work on the lake in conjunction with the algal blooms in the early 1980's, prompted our agency, as a state water pollution control agency, to take a hard look at what was happening. Obviously, nutrients were threatening the lake and nutrients still pose that threat. From Dr. Stanford's work it became apparent that while we could not undo the wrongs of the past, we could greatly reduce the rate at which further damage was going to occur. No one said we could turn things around and go back 100 years, maybe we don't want to, but we have learned alot and we need to take advantage of that.

I would like to point out at this time that the work conducted by the Yellow Bay Biological Station is, in my mind, under-rated. It has made the difference in the protection of Flathead Lake. Having accurate, background information upon which we as people charged with administering water quality laws can make good, technical decisions, may well be the fact that saved the lake. It may turn out to be that important. We are fortunate to have such a facility here, we have taken it for granted in a certain sense, and we need to continue to support them in every way possible.

I recently attended a meeting of the Clark Fork Coalition, in Sandpoint, Idaho, whereby they were discussing the woes of Lake Pond O'Reille. The one thing that I saw, I saw many similarities between the two situations, but the one difference that I saw was that they lacked the information that we have on Flathead Lake to make these decisions. They are still talking about it, we are doing something here. So, in my mind, continued support for the Yellow Bay Biological Station is critical to the future of the lake. And yes, Jack did pay me to make that endorsement.

The Montana Water Quality Act is the basis for our water pollution control program in the state. It provides us with considerable authority, sometimes more than we as administrators like to admit. Jack has mentioned that the lake is in good shape but water pollution control can take two forms. One, you can have a problem, identify it, and then work to clean it up. Or two, you can recognize what you have,, and try to protect it and maintain it at that level. In fact, the public policy statement, in the Montana Water Quality Act, specifically says that it is the policy of the state to provide a comprehensive program for the prevention, abatement and control of water pollution. It is a recognition that Montana is blessed with an abundance of high quality waters and we need to work to keep them that way.

As a water pollution control agency, we first responded to the threat of degrading water quality conditions in Flathead Lake, in 1984, with the release of a report titled, Strategy For Limiting Phosphorus in Flathead Lake. That document contained a six-point plan, a plan of attack, to control nutrients. Before discussing that strategy in detail, and indicating where we are, I want to first remind you that we need to recognize that phosphorus reaches the lake from a variety of sources. Limiting the amount of phosphorus that reaches the lake is everyone's business and everyone's responsibility. You can't sit back and point the finger at everyone else and expect them to do it and get the job done. The logger, the farmer, the developer, merchants, city officials, resource managers, and even housewives, all share in this important task. Controlling any one source of pollution, phosphorus pollution in particular, is important yes, but it won't get the job done alone.

I would like to review those six recommendations briefly with you, tell you what we have accomplished and where we are going from here.

The first, and probably one of the most important, element of our plan was to impose a one milligram per liter limit on the phosphorus in point source discharges, primarily the municipal wastewater treatment facilities in the basin. All discharges are either in compliance or under construction to achieve compliance with that requirement, with the exception of the city of Kalispell. In my mind, it is unfortunate that a community that contributes as much phosphorus as Whitefish, Columbia Falls and Bigfork combined, is the last to face-up to its environmental responsibility. It would seem that that community would be leading the way and setting the example for everyone else, to protect a resource that provides millions of dollars in tourist income each year. Each month of delay may save some dollars, some chemical costs, but at what cost to the lake? The time has come for them to stop dragging their feet and to do their share to solve this problem.

In the last couple of years, approximately 13 million dollars has been spent by other communities in the basin to address their water pollution control needs and phosphorus removal needs. And nearly 40 million dollars will be spent, or has been spent, in the near future dealing with this particular problem. This money not only provides a direct protection to water quality, but I also think we need to recognize that 40 million dollars pumped into the local economy has got to have a beneficial effect. We get double benefit from the money that is spent on improved water pollution control facilities.

The second recommendation in the strategy, addresses continued monitoring and the continuation of a monitoring plan, to evaluate the effectiveness of our strategy and to better define the problems. As Dr. Stanford has mentioned, the Flathead Basin Commission has successfully put together a program funded by a wide consortium of groups to continue this effort. I can only hope that it does, in fact, continue because it does provide us with invaluable information as we assess the effects and the effectiveness of our activities.

The third recommendation was the implementation of a phosphorus detergent ban within the basin. The 1985 Legislature provided the authorizing legislation and both Flathead and Lake Counties have adopted ordinances to prohibit the sale of phosphorus detergents. Many of you sat through the meetings and the debate in 1986, when we were told that to give up your phosphorus detergent would leave your clothes dingy, tattered, and destroy your washing machines. Now I look around the room today, and I see some white whites, and some bright colors. Obviously all of you must be outsiders, you must be from outside the basin. In my mind, the only thing that has turned gray, because of our phosphorus detergent ban, is probably the hair on the people at the Soap & Detergent Association because they weren't very successful in selling the gloom and doom situation that they were predicting. I think, as Dr. Stanford has already mentioned, we have seen significant improvements and significant reductions in the amount of phosphorus from wastewater treatment plants as a direct result of the implementation of the phosphorus detergent ban. It is one step, one piece of the puzzle but it is very effective and we need to continue with that effort.

The fourth recommendation in our phosphorus strategy, was the implementation of a non-point source pollution control program to control nutrients from forest activities, from agriculture production, land development, and urban run-off. Given the size of a drainage basin like this, and the extensive amount of timber activity, timber harvest and agricultural production, this a big task and unfortunately it has not progressed as far as some of the other elements. That is not to say that we are ignoring it. Much is happening in the area and I expect significant improvements in the future. Things such as House Joint Resolution 49, which charges the Environmental Quality Council with evaluating the impact of timber harvest on our environment and specifically water quality, is going to yield some very important results. Section 319 of the Federal Clean Water Act, places a little extra emphasis and encouragement on the part of state agencies to develop a management plan to deal with non-point sources of pollution. We can no longer put them aside because they are a such a monumental task and overwhelming in a state like Montana. The Flathead National Forest, the State Forester, and private timber industry in the state, are putting together a study which is specifically designed to asses the water quality impacts of timber harvest within the basin. The results of those studies will be invaluable in dealing with nutrients and their impacts on water quality in the future.

The fifth recommendation applied to subdivisions and developed land. It said that a more stringent review of those subdivisions that pose a threat to water quality should be undertaken. In 1984, the Montana Water Quality Standards were revised to give our agency just such authority. It allows us to conduct a very close review of those wastewater disposal systems that might have an impact on water quality, to ensure that phosphorus will not reach surface waters, lakes and streams, within 50 years. There is nothing magical about the 50 years but we'll probably all be gone and it will be somebody else's problem or technology will have progressed to a point where we can solve are not done. Our commitment to this control strategy must remain strong. We can't weaken for even a moment. You can't rest on the laurels or on what you accomplished so far, there is still further work to be done. While some of these recommendations and regulations that are now in effect, or they might be coming in the near future, may seem to be a bitter pill to swallow, they may well be the medicine necessary to maintain the health of Flathead Lake. I think the theme of the symposium and the sign that is on the back wall that says "Our Water - Our Future" pretty well sums it all up and I will leave it at that.

our problems more effectively, at that time.

The last recommendation relates to management of wastewater in unsewered communities. Dr. Stanford mentioned the impact of sub-surface disposal systems in the area, in the basin. We have to recognize that over 50% of the people within the Flathead Basin are served by on-site sewage disposal. The typical septic tank and drainfield installation. We have to recognize that fact and deal with it accordingly. The sixth recommendation asks that we develop management plans for these unsewered communities. Progress has been made in this element in some areas but not in others.

A good example, and on a positive note, the Lakeside sewage system has been constructed and will provide adequate wastewater collection and disposal for an area on the northwest corner of the lake that has traditionally had water quality problems, sewage disposal problems. The community of Somers is working now to try to connect to that system so they too can share and enjoy an adequate means of wastewater disposal.

But on the other end, on a less positive note, we still have the area of Evergreen contributing what we feel are significant quantities of nutrients to the river system. As you know, the proposed Evergreen system has been voted down on two separate occasions. That is unfortunate but as they say, the third time's a charm and various groups are continuing their efforts to develop a wastewater system that will adequately meet the needs for the people in Evergreen, and be something they can financially afford. Other areas that are showing interest in central sewage collection and disposal systems include the Big Arm area, on the lake, and Whitefish County Water & Sewer District. I think you will see progress in each of those areas in the future.

A couple of other water quality problems that we need to recognize and one in particular that is also tied to nutrients is sediment. Now the use of land almost always results in some loss of sediment. There are very few things that you can do in using the land that do not result in some sediment loss. We must ensure that throughout the basin good stewardship is followed. And we must ensure that good conservation practices are applied. Montana law recognizes that there will be, in fact, some sediment loss, some impact, but it says "That's ok, as long as you are doing everything you can to minimize that adverse impacts." We need to keep that in mind. We have a responsibility to use that land in such a way that it does not become a problem for the lakes or for others. There is also a problem, in my mind, with the threat from Cabin Creek Coal Mining. I am not going to spend any more time on it because I think Dr. Stanford adequately summarized the potential threat to water quality within the basin, should activities proceed in that particular area.

I hope I have provided some encouragement to show that we have made some progress. We don't want to sit back and relax; we

Water: The Challenge of Conflicting Uses

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Your program is a catalogue of water related conflicts and a roster of presenters who have managed some degree of resolution of conflicts. I anticipate that they will have encouraging comments for you on an array of issues including the management of a river system that is at once a source of water and a sewer; an industrial/commercial corridor and a recreational resource; and the essential ingredient in irrigation, fish and wildlife habitat and power generation. Therefore, my remarks will be limited to the aspects of water use which the Northwest Power Planning Council is obligated to address.

The Northwest Power Planning Council, a regional compact, was created by the Northwest Power Act. Its members are appointed by the governors of the states of Montana, Washington, Idaho and Oregon. In an unprecedented step, Congress authorized this state-based body to guide in various degrees the actions of several federal agencies. These are the Bonneville Power Administration, the U.S. Army Corps of Engineers, the Bureau of Reclamation, and the Federal Energy Regulatory Commission.

Those who proposed the Act intended that Congress address only regional power needs at a time when shortages were foreseen. It is one of the ironies of the Act that it took effect as we found ourselves in an energy glut. The other irony is that it became the vehicle with which fish and wildlife concerns in the region were addressed. Many Northwest citizens and organizations had become alarmed by the impacts of unbridled hydropower development and the declining fish and wildlife populations. Their involvement in the legislative process resulted in language which required the Council to give equitable treatment to both power and fish and wildlife interests. Working with the interested parties in the region including federal and state fish and wildlife agencies, Indian tribes and others, the Council has produced the Northwest Conservation and Electric

Power Plan and the Columbia River Basin Fish and Wildlife Program.

The Council is funded by the Bonneville Power Administrations rate payers and consistent with their interests and the law the Council's Program is limited to addressing the impacts of hydropower on fish and wildlife. It does not address activities such as irrigation, logging or other practices that may have altered habitat.

But the most important limitation in terms of the discussion here today may be that the Council's Fish and Wildlife Program must be implemented within a complex scheme of water rights. Nothing in the Program authorizes appropriations of water or affects the rights to water of other entities or individuals. The Council's intent is that the obligated federal agencies will work cooperatively and creatively under the Program and the Power Plan to implement the Program's water flow measures.

A measure of the constraints is revealed in these gross numbers: the annual flow from the Clark Fork including the Flathead River Basin averages just over 21,000 cubic feet per second. Various claims against that flow aggregate about 330,000 cfs,--about 15 times the average annual flow. And those claims do not include the Flathead Irrigation Project. Beyond that, as you know, the tribes have asserted a right to all waters flowing through the Reservation and separately Indians have claimed all waters in the Clark Fork River Basin under aboriginal rights relating to esthetics, religion and the fish and wildlife habitat. And it is instructive to recall that early conflicts between Montana irrigators and native Indian Tribes over the waters of the Milk River led to the Supreme Court's recognition of reserved Indian water rights in the 1908 case Winters v. U.S. The West is still struggling to come to grips with the conflicts inherent in these "Winters' rights."

Keeping in mind that the average flow of the Clark Fork is just over 20,000 cfs we must recognize also that Washington Water Power in connection with its dam at Noxon has water rights which total 50,000 cfs, a rate which is exceeded only 3 years in 10 and then for 28 days of the year. Fortunately, in the consideration of this inadequacy of water related to claims for its use, we do have adequate electric power and power generating facilities. That current surplus of electric power should allow us to address the issues surrounding water management for power purposes systematically and scientifically. And we are attempting to. And it is about time.

You know the problems which are associated with dams and the disruptions of regimes which occur when impounded waters are used for generation at the convenience of consumers or to accommodate the most economical integration of relatively expensive thermal generating facilities in a coordinated power delivery scheme.

With these problems in mind the Council recently took a step variously describe as "fantastic" or "irresponsible," to direct the federal agencies which must consider its Fish and Wildlife Program and Energy Plan not to license or acquire the generation from facilities built in river reaches which because of their critical value as fish and wildlife habitat have been designated protected areas. This week we expect to finalize the language of the rule. Following public hearings in the four states of the Northwest over a period of not less than two months we expect to adopt the rule, in the form in which it emerges, as an amendment to our Fish and Wildlife Program and Energy Plan.

We are fortunate in Montana that the only generating facility being proposed at this time which would be affected by the protected areas designation is the dam at Jennings Rapids on the Kootenai near Libby. In other states the number of proposed dams makes the rule more controversial.

The Council's action is of special significance to us in Montana because it recognizes the importance of resident wild fish--those in a self sustaining population--by according them protection in the same degree as that given to the anadromous fish which have figured so prominently in past Council actions.

To cite the significance of that is, of course, to acknowledge the enduring problem. It has been described well by Dr. Jack Stanford and I am grateful to him for sharing with me a copy of a draft paper on the subject which he authored with James Ward. He points out with respect to the Columbia Basin that "fisheries mitigation measures, both proposed and implemented, are mainly species specific and largely oriented toward re-establishment of anadromous and adfluvial salmon and steelhead stocks." As a result of that emphasis and the management of the Columbia River system for power he and others observe that the regulated flows in the Flathead-Clark Fork system and beyond are contradictory to those which occurred naturally and in various ways are damaging to the naturally occurring, and for that matter artificially created, fisheries.

Actually Dr. Stanford told me a lot more than I can understand, for example that "Epilithic algae accumulate in heavy mats in hypolimnial tailwaters of the Kootenai and Flathead systems..." After wading through that and some other deep scientific language I floundered on a word spelled **p r e s e n t r u n s**. Reflexively I reached again for the dictionary this time to see what "presentruns" meant. Then I realized it was a typographical error--"present runs."

What Dr. Stanford has pointed out as a system management problem for this area remains to be addressed. His work and others' will help us consider the disruptive consequences of current management practices in the future.

In the meantime significant progress is being made. The Council's Program calls for limits on the drawdown of reservoirs and minimum flow requirements to protect fish and their habitat. Other measures call for storage water to maintain appropriate water temperatures, streambed protection, fish stocking, and a number of studies on fish habitat and the impacts of power generation.

These studies, primarily funded by Bonneville, have been coordinated with the Montana Department of Fish, Wildlife and Parks and, where appropriate, with the Confederated Salish-Kootenai Tribes, the Montana Department of Natural Resources, the Bureau of Reclamation, the Corps of Engineers and the project operators. Most of the studies are scheduled to be completed and presented to the Council this year.

Also the Montana Department of Fish, Wildlife and Parks, along with other state and federal agencies and tribes, will present a coordinated set of fisheries mitigation recommendations to the Council for integration into the comprehensive Columbia Basin plan.

And there are other encouraging examples of cooperation. The Flathead Valley is one of the major breeding areas for wild Canadian geese. Low water levels have created land bridges to nesting islands, making goose nests easy prey. Power operations also cause abnormally high flows during nesting season, flooding out some of the nests. Bonneville and the Salish-Kootenai Tribes have worked with the Montana Department of Fish, Wildlife and Parks to study the geese. New data is giving them a better idea of how to reduce the impact of hydropower operations.

The first wildlife mitigation plans adopted into the Council's program were for wildlife at Hungry Horse and Libby dams. The Hungry Horse mitigation goals call for Bonneville to fund and maintain winter elk range lands in Flathead National Forest; to fund approximately 8,500 acres of riparian habitat and easement for black and grizzly bear; 1,500 acres of wetlands in the Flathead Valley for waterfowl; and to protect 11,000 acres of old growth forest for furbearers such as mink, beaver, otter and marten. At this time there is general agreement between BPA and the State that this mitigation will be funded and sustained by the creation of a trust of approximately $12 million. The major sticking point now is the time during which BPA would be insulated from further claims of habitat damage or loss related to its resources.

Also Montana Power Company and the Montana Department of Fish, Wildlife and Parks reached agreement on appropriate off site mitigation for habitat loss associated with the utility's dam and generation facilities at Thompson Falls. That agreement involves the purchase of water from a reservoir in the Bitterroot River system, another tributary of the Clark Fork, to augment flows on the river which otherwise could be dewatered.

Those are signs of cooperation and of maturity. The players recognize that their competing interests and uses of the river system require unprecedented coordination and communications if together they are to achieve equitable allocations of the resources. The Council has played a significant role in this coordination. Its Program directs federal project operators and regulators to implement its measures and to accommodate the needs of fish and wildlife at every step of power planning. They are to fulfill these responsibilities in consultation and coordination with fish and wildlife agencies, tribes, and the affected project operators.

The Council has adopted measures to ensure that the Program is viewed as a firm constraint on the hydroelectric power system. When Bonneville signs contracts, grants billing credits, acquires resources and takes other related actions it must proceed consistent with the Council's Program. When the Federal Energy Regulatory Commission addresses a hydroelectric licensing application it must give consideration to the Council's Program to "the fullest extent practicable."

All federal project operators and regulators are to integrate the Program's water flow measures into the power system's rule curves, to consider Canadian storage as a source of water for fish flows, and to maintain all fish facilities at their projects in good repair. The Council also urges these agencies to develop mutually satisfactory consultation and coordination arrangements with state and federal fish and wildlife agencies and tribes.

There is after all a network of laws, treaties and jurisdictions governing water use. A system, such as the Flathead Basin, is subject to interrelated authorities at the federal, state and local levels. In this context the Council has value in that it can provide a forum for disparate interests and a link to a comprehensive program that integrates the Flathead subbasin with the Columbia Basin. And through extensive public involvement processes, the Council can expand the opportunities for appropriate participation in water planning, participation which creates an informed audience.

And that observation which smacks of real politics--politics in the small "p" best sense--leads me to this closing quote from a Western Governors' Association work group: "Promoting water use efficiency at all levels of government is a critical task of water policy in the next decades of Western water use. . .There is a broad awareness in the West that the region has entered a different era in water, an era characterized by enhanced management, increased use of non-structural solutions to meeting demand for water, and cognizance of the growing value of water in non-consumptive, instream uses."

AUDIENCE QUESTIONS & ANSWERS

State of the Region

Steve Fisher: I have one observation. For every complex problem at least one simple solution exists that doesn't work. Being from Kalispell, (the problem with phosphorus in Flathead Lake) it seems a little silly to be living on one of the largest, polluted streams in the West. To us it seems like it's a question of ring around the collar verses ring around the lake, and I think in Kalispell people love their lake and it's a very valid thing to love. But in Missoula, although our concerns started out with a fishery in the Clark Fork, we are starting to understand that it's a problem of public health. Groundwater is polluted to the extent, in the basin, that they had to re-plumb Mill Town. And I think that we have to remember in this conference there is an axiom in the West that I heard again on TV last night and that's that in the West whiskey is for drinking and water is for fighting. The irrigators have known this for years and we are going to have to start to understand the theory. We need our clean water not just for our recreation, but also for our children.

Art Thompson: I did hear some reference to heavy metals but I didn't hear any reference to polluting groundwater as a potential for public health impact as inherent to disease.

Steve Pilcher: I can only say that fortunately no such problems have been brought to the attention of the public health agencies, that I am aware of. Obviously, the threat does in fact exist and I think the approach that we are taking is one that if we can provide an adequate means of wastewater treatment and disposal, we will not only solve some of the environmental issues but at the same time prevent some of the public health risks that you mentioned. I know of no known problems of that nature but maybe we get a little lacks at times, and should be giving public health more consideration than we have.

Art Thompson: Does the monitoring process include an assessment of them on an ongoing basis, with particular reference to Evergreen?

Jack Stanford: No, we are not monitoring particular bacterium or protozoan on a routine basis - no, not as a part of the monitoring program. Perhaps that is a consideration, especially for something like giardia, especially if it becomes epidemic.

We do keep pretty close track on occurrence of swimmer's itch and that sort of thing related to algal toxins possibly and the snails that carry it in Flathead Lake.

Christine Olsenius: Steve, are you doing any groundwater monitoring in the area on a basis to quantify what might be there now, as opposed to a problem that arises?

Steve Pilcher: Yes, we are. We are trying, at the present time, to build on some work that Dr. Stanford and others have done in the upper basin, in particular in the Evergreen area. We have heard many people express a concern and an interest over groundwater quality in the Evergreen area. We share that concern and currently have a contract underway to gather additional information on what is actually happening within the Evergreen area and whether or not these septic systems do pose the threat to public health and water quality that we originally envisioned. We hope to have the results of that work out within the next 6 months.

Christine Olsenius: Any monitoring of landfills or other areas?

Steve Pilcher: I honestly cannot respond to that. In a general sense, I am not aware of any ambient-type monitoring, whether or not there are some monitoring requirements associated with the licenser of those landfill facilities, I can't answer that.

Craig Spencer: One water quality issue that has not come up is the Somers hazardous waste site and the old BN railroad tie plant, and I wonder if Steve could comment on this EPA Superfund site and its status?

Steve Pilcher: I will have to apologize but I did not come prepared to address those water quality issues. We do have, in the audience, representatives of the EPA who have the lead role responsibility in the clean up at the Somers site and possibly Dick or Max could give us an update on that. I will get that and get back to you by the end of the day.

Steve Dagger: For Steve Pilcher also. I am a forester and work in the Clark Fork area now but I live in the Flathead Basin. Steve, does the State Water Quality have a direct program to inform people, educate people, about nonpoint sources of pollution? Recently, the State Dept. of Natural Resources had implicated that a pollution problem on Patterson Creek existed and I wondered what you are doing to get that information out to coordinate these efforts?

Steve Pilcher: Obviously, based on the situation that you just mentioned, we are not doing enough to inform the regulated public. The laws have been on the books for a long time. We have not had, since probably the early 1980's, a position within the Water Quality Bureau that had the responsibility of public education and information. It is a luxury that we can no longer afford. Much of the education and information in the area of timber harvest management is passed on to people like State Foresters office, to the Cooperative Extension Service, Extension Forester and people such as that. We would expect the timber harvesters to go to those sources of information for assistance, but in direct response to your question, we do not have a physical and a dedicated public information and education program. That may well be one missing link in our over-all water pollution control program. It may be something that through our efforts under Section 319 of the Federal Clean Water Act, we may want to strengthen.

ROLE OF THE REGULATOR: A Panel Discussion

JERRY SORENSEN

Panel Moderator
Lake County Planning Director

I was delegated by the Commission to be panel moderator. My understanding was that the subject would be "The Role of the Regulator" and all I would need to do would be introduce the people and let them tell them what they do for a living. After agreeing to do that, the Commission had some more discussions and we decided that we wanted the focus of this panel to be effectiveness of government regulation. Well, as a public official myself, I get quite nervous when I am asked to talk about my effectiveness so the task became a little more difficult. But in talking to the panelists over the past week and exchanging a couple of letters, I am encouraged that we will have a good discussion and some good insight can come out of this.

The purpose of the panel is to discuss the effectiveness of government agencies in protecting water quality in the Flathead, and introduce some suggestions for change. The emphasis is to focus on phosphorus and sediment.

The first segment is timber harvest on private land.

The second segment is timber harvest on federal land.

The third segment is on cooperation between the counties, the Tribes and their relationship and the concerned public in regulating activities that effect water quality.

Following the three subjects we hope to have time for questions and comments from the audience.

We have eight panel members and I will give brief introductions to the panelists as that segment comes up. The time is limited and the subject is broad so we will get going.

First segment, Timber Harvest on Private Land, I would like to introduce Bill Parson, Director of Operations for Plum Creek's Rocky Mountain Region (which includes Montana, North Idaho and Northeast Washington). Bill is responsible for land and resource management of Plum Creek's ownership. Bill has a degree in Forest Management from the University of Idaho and has been with Plum Creek since 1968.

The second panelist is Francis Graham. Francis is the chairman of Flathead County Conservation District. He oversees the 310 Program under State law which requires a permit for any stream alteration or crossing on private land, which often occurs with timber harvesting. Francis has been with the Flathead Conservation District for 10 years, as chairman for the last two years. He is a lifelong resident of the Flathead and a farmer. His farm is near Glacier International Airport.

The third panelist on this first segment, is Steve Pilcher. Steve is Chief of the Water Quality Bureau. The Water Quality Bureau's role in this issue is that they respond to environmental problems caused by logging practices.

Jerry Sorensen: The timber operations on private land are monitored by the Water Quality Bureau. For any stream crossing or stream alteration you need to obtain a permit from the Conservation District.

I would like you to respond to how you perceive these processes in terms of necessity, terms of cost and fairness, any problems, and are there any changes you would like to see from Plum Creek's perspective?

Bill Parson: I have given that question some thought and I will give you my answer but before I do I thought I'd like to take an opportunity to pay some recognition here to a local group that has really done some good things. It's our Flathead Conservation District. They have recently received two awards. One award is the American Fisheries Society Award for the Outstanding Group award. The second award they received is the Montana Department of Fish, Wildlife and Park's Conservation District of the Year award. I don't know how many Conservation District members are present here today, but I think they certainly deserve some credit.

The areas I have been asked to talk about basically relate to a law that was passed back in the 1970's. It was known as the Natural Streambed Preservation Act. Many people refer to it as the 310 Law. That is the law that requires people who are going to undertake activities in close proximity to watersheds to get some permits and go through a permitting process. The first question was: is that regulation necessary? What is the relative cost? And can I suggest changes?

On the area of whether or not the regulation was necessary: of course the Legislature thought it was, and in retrospect I would have to say that it probably was necessary because it served two purposes. Number one, it gave the local regulators (the Conservation District Supervisors) an opportunity to become aware of the kinds of activities that were going on in their districts and gave them the opportunity to get involved if they saw that as a necessary thing. Number two, it also provided an opportunity for people who were going to conduct activities to get some expert opinion from the Conservation District Supervisors or the Department of Fish, Wildlife & Parks. I would say that the law definitely was reasonable. I would also say that the law has been administered by reasonable people. As long as you have a reasonable law administered by reasonable people you have a pretty good circumstance.

The other thing I would say is that as long as we can keep things at somewhat of a local level it is a plus. Alot of times we are governed by people who are absent from our local area. In the 310 application and permitting process we are dealing with local people who are familiar with local circumstances.

The relative cost is extremely difficult to isolate and I do not have any dollar values to present today. I would say that the cost has not been unbearable or unreasonable. My personal attitude is that it is probably less expensive to take a project and do it right in the first place - with the expertise and advise that can be provided by the Conservation District Supervisors, their delegates, and the Department of Fish, Wildlife and Parks - than it is to go back and try and correct a project that was implemented incorrectly in the first place.

As for changes, I think the only thing I can say about that is that I really don't know how you could improve upon a process that has the kind of local control and the local effectiveness that the 310 law has enjoyed. So I really don't suggest any new changes.

Jerry Sorensen: Francis, as Chairman of the Conservation District, I would like you to respond to the same question and possibly focus on some problems that the Conservation District may have and any changes that you might like to see.

Francis Graham: I really wasn't prepared to make all of these statements. We have tried to do as fair a job as we know how with all of the different applications we receive. I am sure there are going to be violations of the stream bank law regardless of what we do. We just recently had one up by Coram and there is always going to be those.

As far as the permit, it doesn't cost anything for the applicant to get a permit. We go out as quickly as we can to respond to whatever the applicant wants to do.

As far as changes go, unless the Legislature wants to change something we seem to be fairly happy with the way the law is now.

Jerry Sorensen: Steve, I would like you, as Chief of the Water Quality Bureau, to talk about your perspective on overseeing private timber harvest from the Water Quality Bureau standpoint which is a different perspective than the 310 law.

Steve Pilcher: Thanks Jerry. This is really kind of fun. Seldom do we find ourself in a situation where we have a panel that involves the regulated public, so to speak, and also the regulators. Then have the regulated public get up and say, "Everything is just fine - we can't improve on it", so we should probably just sit down and shut up and call it good. But we are never smart enough to do that. So I would like to make a few comments and expand the discussion a little bit to include those items beyond the 310 permit. We do work very closely with Conservation Districts around the state. We have one permit requirement in our law that deals with instream activities where a violation of water quality standards is unavoidable. We have worked out arrangements whereby we rely very heavily on the on-site observation by the Conservation District Supervisors and the Department of Fish, Wildlife & Parks. If they think everything has been adequately handled by the issuance of the 310 permit, then our permit is automatically taken care of. Things do work very well, in my estimation. I would have to agree with both Francis and Bill from that standpoint.

I would like to make a few comments on the regulator or the role of the regulator in general. Regulations are something that are seldom greeted with open arms. They are probably best described as a necessary evil. I just have to ask you, when was the last time that you stood up and cheered when somebody told you that they passed another law or regulation that told you what you could or could not do. It is just something that goes against the grain. I think it probably gets back to the fact that Montanans, by nature, seem to be a rather independent group, shall we say. They are very protective of their individual rights. In an ideal situation, or an ideal world, everyone would do whatever they wanted to do on their own property but would stop short of something that was going to adversely impact their neighbors, recognizing that their neighbors had rights as well as they did. Unfortunately, it's an imperfect world and we find alot of situations where someone has conducted an activity on their land that has had an adverse impact on somebody else's land. That is when the regulations come into play.

This panel is trying to address the issue of timber harvest and its impact on water quality and the role of the regulator. No regulator in his right mind would come into the center of logging country and start accusing them of causing water quality problems, so I will have to be a little bit careful and tactful as to how I say this. And I don't want to sound like I am going to come in here and point a finger at the logging industry because that would not be fair. There are documented water quality problems associated with logging activities. That really should come as no surprise to you here, given the number of acres that are under timber harvest in the Flathead drainage. I mentioned earlier in my presentation that there are very few uses of land that do not come with some sediment loss. We are just trying to see that that sediment loss is kept to a reasonable level. I'm not saying that the logging industry is any worse than other activities or any better. It's just a fact of life that there are some timber sales where they have had problems. There are other timber sales that have been conducted in total accord with the environment and have not caused any environmental degradation.

I am not going to take alot of time to review the regulations. Jerry said we couldn't do that and we don't need to anyway. I would like to make a few comments as far as what I think needs to be done to establish a good working relationship and to provide the type of environmental protection associated with timber harvest activities that we really need.

One, we as a regulator will never have the resources to go out and baby-sit all logging activities. The legislature never intended for that to happen.

Secondly, we need to stress education and information. Someone over here this morning raised the question about the education and information program relative to timber harvest activities. We, as a regulator and water pollution control agency, have not undertaken a specific program to educate the logging industry as far as water quality problems. We need to stress the importance of groups such as the State Forester's Cumulative Effects Cooperative, that has made great strides at getting the various interest groups talking together about what is going on within a given drainage basin. It has worked very well from a water quality standpoint. We need to support the effort of the extension forester to get out and talk to these people. To let them know that there is a way that they can go about conducting their logging practices and still not cause environmental devastation.

Third, along with the carrot goes the club, we have to have an active enforcement program for those people who can't live by the same rules that everyone else is abiding by. We have seen some recent examples that would indicate that no one is above the law. The law applies to everyone and it's our job to see that it does. We have adequate enforcement responsibility, in the Water Quality Act, for any source of water pollution. We don't want to abuse that authority but we do need to let people know that it is there; it is something to be concerned with; and it is not a concern as long as you abide by the rules that have been established. In a sense, abide by common conservation practices.

Jerry Sorensen: The second subject we want to talk about is timber harvest on federal land. We have two panelists and I'll introduce them individually just before they come up. The first panelist is Ron Haag. He is the director of range, air, watershed and ecology for the U.S. Forest Service Northern Region, which is a five-state region. He has overall responsibility for leadership and direction on environmental issues. Ron has a B.S. degree in wildlife management from Texas A&M and a Masters in range management from Texas A&M. He has worked in Texas, New Mexico, Arizona, Missouri, and now Montana. He is interested in future management of natural resources and he lives in Missoula.

The question I would like to ask you is that the Forest Service is responsible for monitoring and mitigating the impacts of logging on federal lands. In your opinion, is the Forest Service doing an effective job in protecting water quality? Consider the laws and regulations; the processes you operate under; and the relative costs. Also, we would like your perspective on any changes you feel are needed.

Ron Haag: Thank you Jerry. First of all, I really appreciate the opportunity to be here today and to address this group. I really appreciate the theme that the Flathead Basin Commission has chosen, "Our Water - Our Future." I guess I would submit to you that basically it is not so much our future as it has been our past and the things we do today that will truly determine how we use our water in the future. So, I think this is very timely and I really appreciate the opportunity to be here.

As far as the question that Jerry asked me, in terms of how effective we are in managing the water quality from national forest systems lands, I think for the most part we are doing a decent job. I do think that there is room for improvement and through our forest planning process we are striving to do that. With that in mind, I would like to share with you how we would like to do that.

Basically, we have attempted to develop a strategy for water quality that has five basic points that we think will help us to insure that our water resources from national forest system land has been appropriately managed. These five areas deal with that of analysis, as far as the project proposal is concerned; that of cumulative effects; that of soil & water conservation practices (which we feel is a cornerstone of our strategy); that of monitoring and evaluation; and something we call feedback in terms of taking all of those results and bringing them back in to the decision making process. Then I think more importantly than all of those, underlying all of those different steps, is public involvement in that decision making process. We are quite concerned that people who are interested in the water resources have an opportunity to participate.

First, in terms of our analysis we will look at a project on an integrated basis. We are not just going to look at a timber sale itself or a proposed recreational activity. We will look at the proposed project area and we will look at all the resource activities. Our analysis will include the inter-relationship of these various aspects. We are going to evaluate the site specific needs for the project proposal and we will evaluate the project proposal in light of our forest plan goals and objectives. But one thing that is paramount in all of this is that projects we find that do not meet water quality standards will be either re-designed, rescheduled or dropped.

Our second step would be a cumulative effects analysis. Basically that is the impacts of other projects on the action being proposed. That includes not only national forest system land but also activities from State and private land. We are quite concerned that on a basin or a watershed basis that our proposed activities do not impact water quality for the whole watershed.

Also if we find during our cumulative effects analysis our proposed project can't mitigate in a manner that will not impact water quality we will forego that project.

The cornerstone to our strategy is Soil & Water Conservation Practices. We have chosen a label of Soil & Water Conservation Practices as opposed to Best Management Practices, because Best Management Practices has a specific legal meaning in relation to the Montana Water Quality Act. We are very concerned about keeping some differentiation between those two approaches. We have developed a Soil & Water Conservation Practices Handbook. A gentleman earlier asked about training and instruction in terms of how you carry out the practices. We hold on-going training sessions with our people and with our contractors to do just that.

The Soil & Water Conservation Practices employ trying to do the best job we can to minimize impacts on water quality. Consequently, those become contractual obligations that individuals who are operating on national forest service land are required to carry out.

In the past, when you talk about Best Management Practices people have a tendency to stop right there and say, "Well, if in fact you have done those kinds of things, everything's going to be fine." I don't share that belief. The best plans of mice and men go astray. Consequently, you have to go forward with changing activities that are state-of-the-art. But, as you move forward, it's very important that you have an on-going monitoring process. So, an integral part of our strategy is monitoring and evaluation. I have a tendency to think in very simple terms and so consequently it's back to the three step process. Many times we say we are going to do things and in fact we don't follow through. So the first question we have to ask ourselves is, "Did we do what we said we were going to do?" Pure and simple. It doesn't make any difference if you have a list of Soil & Water Conservation Practices and all of the scientific theories in the world says it's the best thing you should do, in terms of protecting water quality, if you don't employ them. So, the first thing is: did we do what we said we were going to do? And of course the next question that seems to follow that is, are they effective? Did they work? Somehow you have to evaluate that.

Then we have some long-term strategy, similar to what Dr. Stanford shared with us this morning, including modeling of our baseline watersheds. We need some baseline data in order to make comparisons and validation. Then, once you find all of this out it doesn't do us any good unless somehow we crank that back into our thought processes and into how we make resource decisions. Consequently, we have developed what we call a "feedback loop" which is basically validating, modifying or stopping our practices until water quality is being protected. It is a learning process and it's on-going.

Underlying all of this is our coordination, cooperation, and our involvement with others. I really mean that, not only from the analysis aspect but also monitoring. As Steve pointed out, none of us have the people, the staff, or money to carry out these tasks ourselves. It is very important that we work together on these issues.

Jerry Sorensen: Thanks Ron. For the second perspective on this subject, I would like to introduce Jon Heberling. Since 1974, Jon has been a private attorney with a law firm in Kalispell. Jon has a B.S. degree from Duke University and a law degree from the University of California at Berkley. Jon has worked on numerous environmental cases, many of them here in the Flathead. His resume indicated that he is undefeated in that area. Jon has worked on a number of appeals to timber sales, some of them are still pending. He has also participated in an appeal of the Flathead National Forest Plan. Jon also has served on the steering committee for the Flathead River Basin Environmental Impact Study from 1977-1983. From 1982-1985, Jon was the director of the Whitefish Water & Sewer District, which prepared a water quality management plan. Jon, obviously, is very concerned about environmental issues and so I would like Jon to talk about his perspective on the effectiveness of the Forest Service in protecting water quality and include any suggestions for change.

Jon Heberling: First of all, the mention of being undefeated makes me a little nervous because I am always fearful that the string of cases is going to come to an end. And also, I don't take personal credit for any of these cases because they were all group efforts, generally by local conservation groups.

My perspective on timber harvest effects on water quality on Federal land is much more local than Mr. Haag's focus, which would be region-wide. So I'll be speaking about the Flathead Forest and as a representative of conservation groups in appeals of the Flathead National Forest Plan. So that's the major area of my experience with water quality and the Forest Service.

I only have ten minutes or so to deliver these remarks, so I have printed them out with citations and references for those of you who may be interested in looking into this a little more deeply.

I will focus on fisheries because I agree with those who say the best way to monitor the effectiveness of water quality protection on wide-ranging forest land is to see how well the fish are doing. I won't dwell on the importance of fisheries to the Flathead economy or to recreation and tourism here. Tourism is our growth industry. The Flathead Basin Study showed that over the years 1968-1978, 90% of the net increase in jobs in the Flathead were in tourism and that trend has continued. Tourism jobs continue to increase whereas timber industry jobs decline, even though the Flathead Forest's annual cut remains at a average of 100 million board feet over the last fifteen years. Timber industry jobs have declined largely due to mechanization in logging and in the mills. The other industries, locally, have remained fairly flat, in terms of employment levels, and so tourism is our growth industry and fisheries are very important to tourism.

I've been asked to answer four questions. First of all, whether the Forest Service is doing an effective job in protecting water quality? I answer that no.

The second question is whether the laws and regulations are adequate? I would say yes.

The third question is what is the public cost of water quality protection and is it fair? My position on that is that the protection of the critical trout streams in the Flathead is close to zero in dollars. I will explain that a little later.

The fourth question is whether I would suggest some changes in Forest Service management? And as you might suspect, I have some suggestions along that line.

The first question as to whether they are doing an effective job: The decline of the fisheries, locally, has been a matter of great concern particularly over the past couple of years. The Flathead Forest Plan candidly admits past problems. It states that "continuation of current management would result in adverse effects on a significant number of watersheds throughout the forest." In connection with the draft E.I.S., the sediment model was done for prediction of water quality effects and it found degradation in 45% of the watersheds on Flathead Forest based on the projections for the next decade under the Forest Plan. The

Flathead's response to that was to drop the model. The Forest Service generally takes a position of "we will do better in the future than we have in the past". The American Fisheries Society examined the matter of water quality protection and fisheries on the Flathead Forest and concluded that the Flathead will do worse in the future. They found significant degradation of fisheries.

Briefly, the problem is that the Flathead is moving its program of clearcuts and roads onto the steep slopes above these critical fisheries. Whereas, in the past ten years 3/4 of the timber sales were on less than 40% slopes, in the next ten years 3/4 of the sales will be on steeper than 40% slopes, with 1/4 of the sales on over 60% slopes. The Flathead's own documents show that they estimate that on 60% plus slopes with erosive soils, 80% of the sediments will reach the streams below. The problem is that every one of the critical trout streams has these 60% slopes above it and they are almost all threatened with clearcuts and roads.

We have heard alot about the kokanee crash in the Flathead. A few months ago there was a meeting at Cavanaugh's where the problem was discussed. A member of the audience stood up and stated that it was his understanding that this had occurred on hundreds of lakes across North America and in not one of the lakes had the kokanee population recovered. Jim Vashro who is regional manager for Fish, Wildlife & Parks agreed. He stated that we really have no good news for you on that. The fisheries biologist generally suggested greater reliance on native species, which is bull trout and westslope cutthroat trout. The problem is that these species spawn in the reaches of streams on Forest Service land and may be threatened by clearcuts and roads. The State of Montana summed it up and I quote: "Accelerated road building and timber harvest on U.S. Forest Service lands now poses the greatest single threat to aquatic life." That was in their 1986 report to the EPA. Based on all of that, I feel the Forest Service is doing a less than effective job in protecting water quality.

The second question I can answer more quickly. I believe the laws and regulations are quite adequate to protect water quality on Forest Service lands. In the handout I have detailed the citations and the quotes of the legal handles that lawyers would use in an effort to protect water quality. The important point is that most of these regulations have recently appeared in the forest planning process and they are only now beginning to be imposed on the Forest Service in the courts. So in terms of the evolution of the law, we are still in the early stages of a specific protection on Forest Service lands. One very interesting item is something mandated by the National Forest Service Management Act concerning management indicator species. It used to be that a fish or wildlife species would have to make the endangered species list before it would have any substantive protection. It would have to be considered in an impact statement but that's only a consideration. Then the government agency could move on to permit the project and the impact statement itself was not a substantive protection for these species. Well, as management indicator species, the Flathead selected the bull trout and the westslope cutthroat trout for fish. The legal requirement is that habitat be maintained for these species. That means no backsliding, no degradation of habitat. I think that will be an important protection.

As to the processes for enforcing the law, there is a problem there in that this is largely self-policing. The clearcuts and road building activities occur on remote lands and there is little in the way of regular policing mechanism. Mr. Pilcher mentioned that the budgets simply aren't adequate to baby-sit all of these projects. I am unaware of the Forest Service ever turning in a logging contractor for running equipment across a stream. That would be the Forest Service turning the logging contractor in to the Water Quality Bureau for violation. This is generally left to citizen efforts, people who are familiar with the lands or maybe hike up there, go motorcycle riding up there, and they are aware of certain violations that occur. Then they may take pictures and bring them to the agencies.

The third question is what is the relative public cost and is it fair? My position is that the public cost of protecting the 28 critical trout streams on the Flathead is zero dollars. The Flathead Basin Study showed that 90% of the bulltrout spawn in just ten streams. So it would make sense to protect these ten streams. In addition, the American Fisheries Society tossed in eighteen pure, westslope cutthroat trout streams to make twenty-eight. In order to protect them, the Forest Service needs do two things. First, is to stop cutting in the riparian areas down to the stream banks, which they have promised to do. And secondly, not to cut the 60% plus slopes with erosive soils above these critical trout streams. Attached to the American Fisheries Society's comments are some maps which show where these erosive land-types are above each of the critical streams. The land areas were added up; the total is 51,000 acres. The Flathead could withdraw this acreage from its timber base and protect the streams. This 51,000 acres is less than 1/3 of the excess in the timber base on the Flathead. So, the Flathead could still cut its 100 million board feet and protect these streams at least for the next ten years. I believe the real crunch on conflict with trout streams and logging would occur perhaps ten or twenty years down the road. At least for the next ten years we can protect these critical streams.

As to the cost of water quality monitoring, the 1986 Flathead Monitoring Report shows an expenditure of $217 million on soil and water quality. It isn't exactly broken down, so I cannot say how much went to monitoring. This is less than 2% of their budget. The Flathead received 74%of its requested appropriation for that year, but it cut water quality to 35%. Meanwhile, roads received 94% of their requested funded level. So my position would be that the cost of water quality protection is very small, particularly in comparison to the cost of running the Flathead Forest which operates at a $10 million taxpayer loss on an average over 1981-1986. The next decade's plan intends to loose $12 million per year. One might ask, why degrade trout streams and damage water quality at a taxpayer loss of $10 million or more? I'll let that question just hang.

The last item is, are there any needed changes? The first one is the suggestion to re-shuffle the deck on timber sales and not cut in the drainages where the critical trout streams are. The second one would be to fairly fund water quality, meaning that if the Flathead doesn't get all of the money it asks for, if it only gets 74%, then water quality should be funded at the 74% level also. A third one would be to monitor the critical trout streams. There is a list of streams that the Flathead monitors but that list has no apparent relation to the list of critical trout streams. We wonder how they arrived at the selection of those streams, but I think the limited monitoring that is available should be focused on the best trout streams. Another one would be to conform the Best Management Practices as set forth by the Flathead Forest to the Best Management Practices for protecting water quality as set forth by the 208 Drainage Project and the American Fisheries Society. The Flathead's selection of Best Management Practices is less than state-of-the-art. A last item would be to apply sediment models to timber sales before they are signed off so that water quality effects could be estimated and that a sediment model be developed for westslope cutthroat trout. There is one for bull trout.

In closing, I must say that I find it exciting to work with so many people who are so energetic and so interested in protection of water quality. There is a lot of citizen activity in the Flathead and I think for that reason we have a special situation here and we have a lot to protect.

Jerry Sorensen: The third segment that we are going to talk about is a change in focus from the forest to local regulation and cooperation between Flathead and Lake Counties, the Confederated Salish and Kootenai Tribes, and the concerned public in regulating activities that effect water quality in Flathead Lake. I want to make a clear ground-rule at this time that we acknowledge that there are areas of jurisdiction that may not be clearly defined or mutually accepted, and this panel is not going to involve itself with those legal issues. With that, I would like to introduce the first panelist, Paddy Trusler. Paddy is the administrator of the Lake County Land Services Department, which is responsible for public health, sanitation, planning, and refuse. Paddy is my supervisor so this is one chance that I have to call-in an order if I need to although I recognize that my budget is coming up soon.

Paddy was raised in the Polson area. He has a degree in Environmental Engineering from Washington State University. He has worked for Missoula County as a Sanitarian, and also for the State Department of Health and Environmental Sciences, Solid Waste and Hazardous Bureau. He has been president of the Montana Environmental Health Association. In his spare time Paddy owns and operates the original family farm near Polson, and fixes fence and complains about the weather. So with that, Pad, I would like you to come forward.

Paddy Trusler: Thank you Jerry. As Jerry indicated I have been a resident of the Flathead area, more specifically the Mission Valley, for 30 plus years. In being raised in Polson, it was a fairly short jaunt over to Hot Springs and the Lone Pine area where Mr. Pablo was raised. During that time in our life the only thing that was really important was who was going to have enough nerve to go into the Long Branch and see if we could buy beer. Obviously, things have changed a lot. Mickey obviously has his problems; Lake County has several other problems.

In the discussion today, Jerry outlined four areas that he wanted to touch on. Those had to do with subdivision review, lake shore construction, individual sewage disposal regulations, and also public sewering. I am going to try and address each one of these separately.

With regard to subdivision review, we have a unique area in that we have what we call "fee land" and then we have "trust land", which is under the jurisdiction of the United States Government. This trust land is also synonymous with tribal land if you want to use that term. As far as subdivision review is concerned, I guess it continues to be unclear what type of joint cooperation we're going to have with the Confederated Salish & Kootenai Tribes. Currently, the Lake County Planning Board has a position for tribal representation and I think I am accurate in saying that that particular position has been held by Mr. Thurman

Trosper since the onset. We also send our comments and staff reports to the Tribes for their review and comments. We have undertaken a fairly lengthy process of developing land use guidelines for fee patent lands in Lake County. During this time we have tried to involve the Tribes and their particular properties. Unfortunately, the comments that we have received have been fairly minimal. The Tribes are hiring a private consultant to train some of their personnel in land-use matters. I certainly hope that will bring about the type of cooperation in land-use issues to develop the consistency that we are really trying to develop in Lake County.

As far as lake shore construction is concerned, here again we have a little bit of miss-match in that within the boundaries of the reservation, Lake County assumes jurisdiction from the high-water mark of Flathead Lake twenty feet landward. The Tribe has jurisdiction from the high-water mark lakeward. On those areas outside of the reservation, Lake County assumes jurisdiction in both locations. After the Neiman case was adjudicated, the Tribe developed their own set of lakeshore protection regulations and put that under the jurisdiction of the Shoreline Protection Board of the Tribe. (I see Mr. Jackson sitting over here.) A review of those particular regulations indicate that they are pretty much the same as the ones Lake County used prior to that case and are still currently in use. It would certainly be my feeling that there is a lot of consistency in the way that those are being administered. In fact, there has been several instances in the last few years where the personnel from the Planning Department and Shoreline Protection Board have reviewed projects which are of mutual concern to Lake County. I would suggest that in the slower time for shoreline protection work we could get together and discuss some of the things that we have experienced in our program, gain a little bit of information from experiences, and see if we can't come up with better regulation than we have now.

Now an area that is true and dear to my heart, individual sewage disposal systems. Any way you shake that out it is septic tanks and drain fields. Currently, Lake County employs three registered sanitarians. Part of their function is the design and inspection of individual sewage disposal systems on fee land. Lake County, through their regulations, also requires a license to be held by all those who install individual septic systems. I believe I am correct when I say that individual systems on trust property are designed by the Indian Health Service and then they are contracted for installation by private contractors. I am sorry to say that at present there is very little, if any, cooperation in this particular area between the Tribe and the County. This is an area where we have to be mutually concerned about what is being put into the ground, what is being leached into the ground and what problem that may be causing. There is a lot of expertise that can be gained for everybody involved. I've noticed that in talking to some of the Indian Health Service people that the Tribe is contracting for engineering services that are currently provided by the Indian Health Service.

Hopefully, once this engineer is hired and is on staff I would highly encourage a meeting of the minds in this particular area to see how we can improve that particular relationship; make sure the systems are designed, installed, and inspected; so that we can protect contamination of our surface and ground waters. Lastly, and this will be brief, has to do with public sewerage. Most public sewerage in Lake County as it is in the State, is the responsibility of the State Water Quality Bureau. On the reservation, it is the responsibility of the Environmental Protection Agency. I believe they both work under the same set of regulations and we are seeing a lot of consistency in that area. So I guess what I am going to comment on is the development of new public sewage facilities in the area. Currently, Lake County has two active projects for public sewerage. One of them is in the Big Arm area, the other one is in the Arlee area. One project has had a facility plan completed, that being Arlee, however was never implemented. Nancy Thormalen from the Planning Department of Land Services is trying to get that process going in the right direction again. In Big Arm we are right in the process of developing the facility plan. Currently the Tribe, having a vast ownership of land in the area, have ex-officio representation on the Sewer board. We are not far enough along yet to know exactly what is going to come out of this particular plan. There is a lot of enthusiasm and we are hoping that it is going to lead to good things. That good thing in my mind is the development of a municipal sewage treatment system for Big Arm.

I have one last comment and that has to do with the question of cooperation. I would like to use two words here: cooperation and consistency. I think it is very important that we cooperate and it is also very important that we are consistent because obviously if one particular body does something that is contrary to the other, that inconsistency causes a lot of problems and certainly leads to a lot of misinformation. When we talk about cooperation we must realize that this requires effort on everybody's part. I believe in environmental issues such as we are talking about, I don't believe jurisdiction should ever become a question. We all live in the area and we should be mutually concerned about what happens to our resources. I believe it is imperative that we begin a dialogue to insure the high quality environment for everybody to live in.

Jerry Sorensen: The next speaker will be giving the perspective of the Confederated Salish & Kootenai Tribes. I would like to introduce Mickey Pablo. Mickey is the Chairman of the Tribes and is in his second year. Mickey has lived on the Flathead Reservation all of his life and is a fifth - generation rancher. He ranches 12,000 acres in the Nirada area near the Big Draw with his wife and three children. Mickey has also been the Conservation District Supervisor the past seven years in eastern Sanders County. He has been on the Tribal Council for five years. He was on a Shoreline Protection Board for three years.

And we have worked with him on the Flathead Basin Commission for the last two and one-half years. With that Mickey, we look forward to your perspective.

Mickey Pablo: Thank you Jerry. To begin with, you have to catch a little bit of history. The Namen decision was brought up, and sometimes it takes awhile to get rid of old feelings. Maybe there are still some of those old feelings out there. Recall at that time the city of Polson, Lake County, and the State of Montana had joined in the Namen suit to prove that there was no longer a Flathead Indian Reservation. Sometimes, it takes new people to get working together and I feel that the people that are there now can start to build bridges to get everything going in the right direction.

On subdivision review; we are working very closely now with Missoula County and I think we can get that extended also into Lake County. But when you look at land use planning, especially subdivision review, you have in essence what would be a development plan. You are looking at how you are going to develop something. On the other side, the land use plan could also consist of a preservation plan. You have to figure out what those balances are. Sometimes it gets very difficult. Also on the Flathead Reservation we have four counties that are included in the Reservation. So if we work on one to get a plan, let's say in Missoula or Lake County, will that be compatible with Sanders and Flathead County? We have to look at a plan that is compatible throughout the reservation. It may be somewhat different than what one county has implemented or that another county is planning to, so we have to have everyone involved. If we don't then we as a Tribe could be liable because we would be asserting authority on someone that would be inconsistent with someone in another county.

On lakeshore construction; I feel especially that the citizens have been greatly involved with the Tribes. I know that last year Jack Greaves was Chairman of the Shoreline Protection Board and was also President of the Flathead Lakers, which shows a very good cooperation effort. I think everyone around the lake, on the south half when I was on the Shoreline Protection Board, seemed very comfortable with the plan now because it gets into a self-regulation. If a neighbor goes out and does something they call up the Shoreline Board and say, "Hey, can he do that? Does he have a permit?" In all regulation, that's where it needs to come from - the people first. Because if you take any one of the regulators that are around here and go out and tell somebody, "You can't do that," then immediately the hackles are up. But if all of the citizens and his neighbors are saying, "Hey, maybe you shouldn't do that," and if we can get together and work it out locally then we don't need us regulators up here. Personally, I don't like regulations but I guess they are needed. If we could do everything right, we could probably all save a lot of money.

What Paddy referred to on the septic tank permitting is that the process is handled through the Indian Health Service. Their engineer should be back on line very shortly. As we get into the public sewerage like at the Arlee area the Tribe, a few years back, bought land there for the purpose of putting in a sewer system. They bought the land with the idea that when they get the sewer system planned out for Arlee then that land would be donated for that system. We have tried to work in other areas in the same way and it's something that is very needed. When Lakeside began their project we donated $500 from the Tribes to help get some paperwork started. Sometimes we don't have the cooperation that we should have right away. I think it is going to take awhile to get there and we are moving in that direction. With people like Paddy and people like we have working on our staffs we can get together and work things out. Sometimes it is the elected officials that maybe really need a little change.

Jerry Sorensen: Thank you, Mickey. I had to look at my County Commissioner after that comment.

Again, a little change in focus. The third panelist is Bruce Young. Bruce is the Broker/Owner of REMAX Land and Lake Realty, in Kalispell and Bigfork. Bruce is a conservationist and a concerned citizen for many years in the Flathead area. He is and active member of the Flathead Protection Association, which is a group dedicated to maintaining clean water in the Basin through education and increased public awareness. Bruce currently is chairman of a group called WATER, which is producing a series of videos on water quality. He is one of the first people who raised issues concerning phosphorus sewage treatment plants and their impacts and the need for planning and zoning in fragile areas of our watershed. It is encouraging to me to know a realtor who is so actively involved in water quality issues, which by nature of the resolution, may limit what is often considered open-ended property right in Montana. There are also some realtors I work with in Lake County that have that attitude and I see that attitude growing all of the time which is good.

Bruce is going to give a citizen's perspective on cooperation between the government and the public. His perspective is as a conservationist.

Bruce Young: Thank you Jerry. First off I would like to say that so much of what we are going to do with our water in the future depends on our attitude and the awareness we can create universally throughout this valley with the public. In response Jerry, to your particular questions about maybe my perspective, I would like to lead-off by sharing with you that I find there's, in the past, a very intermittent coordination of various activities by the County, by agencies, and by the public at large.

Not often has there been an opportunity to have a cooperative dialogue on the many complex issues of water, in this basin. The opportunities just really began in the last year or two with the advent of the dialogue that has been created by the Flathead Basin Commission and some of the other agencies involved.

The problems that result from the lack of communication coordination between all water-related agencies are far too numerous to detail. We are really talking about a very, very complex issue here. However, one can see that there is a lot of players in this issue of water in the Flathead Basin. To name a few, we could start with the State Water Quality Bureau, Federal Fish and Wildlife Service, local citizens, tourists, Kootenai/Salish Tribes, Fish & Game, Bonneville Power, Municipal Sewer Treatment Plants, farmers, ranchers, and approximately 240 other entities and agencies that have water-related concerns.

You can see that there is a diverse need in usage of our existing water already. There are conflicting water issues today that are in need of immediate dialogue and solution. It appears that these conflicting usages are going to grow in this state and especially in this section of the state. Especially considering lower than average spring run-offs in our drainage.

In looking onward and at further questions and looking at our subdivision review, the people, including government positions, need to know more about the complexities of our subdivision rules and regulations. We all need to work more closely with our regional planning offices. Many times they are understaffed, underfunded. They are doing the best they can. We need to get this information out to the public. We need to help them get the information out to the public. The only way we will get our public involved is to have them educated and knowledgeable about this complex subject. Our planning must have the ability to be flexible, creative. Especially in grandfathered special case properties. Properties where you need to work out an improved situation concerning sanitation and sewage, in difference to saying, "Well, this is all we can do." We need to be able to do that. I would say there are areas where 1 to 5 acre parcels or simple land splits where sanitation approval should, and could, be streamlined, at least at the state level, perhaps from 60 to 30 days. I am not suggesting this timetable for a full-blown 80-lot subdivision. For the simple subdivisions, I think there is every reason that we could streamline our bureaucracies timetable there.

When it comes to addressing lakeshore construction, shoreline and dock rules and regulations, I believe there should and could be a unified set of considerations agreed upon by the state, by the Tribe, by Flathead and Lake Counties. The lake is contiguous. The Basin is contiguous. It should be our effort and agreement to manage and regulate this precious and interconnected resource. I agree with Mickey Pablo. I think it's possible and I think we need to move forth to do so. With pursuit of uniformity as a goal and a common interest we all share, we must continue this discussion on a planned basis in the future.

As far as addressing septic tank permitting, it is done locally and it is done at the state level as well. Sanitarians in our area do a good job in my point of view. I have had the opportunity to go out with these people quite often and check sanitation perc tests. Yet, there are times when they don't have the flexibility to make an existing poor septic condition much better. At times when a holding tank, a propane toilet, a Clivus Multrum or some other sanitarian's answer would be better than an existing bad grandfathered condition or better than a special case property with a problem. There again, we really do need some flexibility for good management in the sanitation area.

In the issues of public sewage, we've really just begun to do what is necessary in order to protect our water quality. Yes, believe it or not, we are starting phosphate removal. It is only twenty years after Michigan did it. Not too bad. But the problem is we still have further problems to look at. We haven't yet considered or addressed the toxic chemicals, such as benzene, vinyl chloride, creosote, lead, or about twenty-seven other highly toxic chemicals all named in Proposition 65, a new Public Toxic Protection Law from California. They just passed that law. There are really long-range cumulative and health-risk potential problems if we do not return drinkable water from our local treatment plants to the system. I think we can all recognize, I think we must all recognize, that as citizens we have the need to participate in the issues of long-range water and sewer planning. Sometimes departments can feel a need to be politically expedient in determining what to do about polluted areas or in bringing about long overdue water violations, violation corrections, and changes at municipal treatment plants. These actions can really send the wrong message state wide about water quality. These agencies need to hear from you. From all of us as citizens. They need to know we care. When an agency asks for a variance which will degrade our water quality instead of improve our water quality, they are taking the lead in the wrong and future costly direction. All of this is short-term logic and leads us to a band-aid solution for a serious, complex problem in managing water. We can eliminate for 5 or 10 million dollars today, a 50 to 100 million dollar future watershed problem.

There is real economics to water. The public needs to know and understand that they have a real interest in this water. We all do. It is vital that all effected parties and agencies with water related concerns continue this discussion in the Flathead Basin, in the valley, about our most valuable asset - our water. We must make everyone, from our elected and appointed official to the public, aware of water. What is it's value; what is necessary to maintain our water quality; what are the real economics of this water we have out here? I would suggest, I would advocate, that clean water is so important to the future of this valley that the Tribe, the state, Flathead and Lake Counties, should dutifully and officially appoint water commissioners. These four commissioners would be able to coordinate our water quality efforts throughout the drainage basin, and concert with all other agencies and interested parties. They would move us toward a very coordinated water management effort. I am sure that those of you who have studied it, recognize that we are in the eleventh hour in our opportunity for a coordinated effort, to address the issues of clean water in this basin.

Elected officials must learn about the complexities of this water issue and they are vast, they really are. They must facilitate good, long-range planning for the communities and they must share, with the public, information; as much sharing as they can do to make the public aware. We need that interaction between the public and the elected official. They must share problems and solutions about water related issues. We need our official agencies to continue and expand the dialogue about our water and to thusly keep the public informed about their coordinated efforts to manage our water.

There should be scheduled public information meetings about water quality, about current laws, about issues and solutions. My perspective: self-education, and education and awareness of the public at all levels is our best hope in maintaining our water quality in this Basin. In order to maintain this quality, it will take an arduously coordinated and scheduled, cooperative effort to define and address and collectively address the issues with interaction in an organized manner on a regular basis. This is no easy task. This is a great start today and I really applaud the Basin Commission, the Freshwater Foundation, and the Northwest Area Foundation for helping put this initial dialogue together. With a constant eye to the future and to the fact that this water belongs to everyone, everyone who is responsible should take great interest in participating and becoming knowledgeable about the far-reaching water issues facing and effecting the Flathead valley's future. It's your water. I think we all need to participate and invite that participation from every segment of this community. Thank you very much.

Jerry Sorensen: Thank you Bruce. We covered many issues and topics with each perspective here. We would like to open it up to you at this time for any questions or comments you might have.

AUDIENCE QUESTIONS & ANSWERS

Panel Discussion: Role of the Regulator

Ben Cohen: A brief comment, first of all. I think it is excellent to hold a conference like this where all bureaucrats and different agencies can communicate with one another but, in the interest of citizen involvment, I would like to point out that in a meeting held at different hours, on the weekend or evenings, we would probably see a different mix of citizen verses bureaucrat participation. I know that all of the bureaucrats here as part of their job's responsibility. What few citizens attended, are either retired or unemployed. I think very few were able to take a day off of work to attend this kind of thing.

Now, I would like to make a specific question involving our Flathead County Conservation District. Lewis & Clark County Conservation District passed a sediment control act back in 1977. Part of it involves Best Management Practices and guidelines for Forestry activities. It requires forest harvest and management planning on private property and in the case of timber harvesting, requires filing a notice of proposed timber harvest and requires following some BMP's that involve more than just the acquisition of the 310 Permit before crossing the stream. They are looking at all of the possible erosion that can occur. That's a conservation district wide plan. I guess I would like to address my question first to Francis who represents our local conservation district and then also, searching for some citizen representative up there, I would like Jon Heberling to also comment on this.

Lewis & Clark Conservation District has a set of control ordinance that, among other things, requires the filing of a logging plan compliance with BMP's. Should the Flathead County Conservation District initiate a similar ordinance?

Francis Graham: We really haven't looked into that too much. We are aware that the bill did pass the last legislature. Like I said earlier, Only about 10% of our permits that we issue are on Forest Service Land. But I guess we could sure look into the mismanagement.

Ben Cohen: Excuse me, first of all there is no bill that I know of involving BMP's that passed the legislature, only a study. My question is, I am principally concerned with the commercial forest plans in Flathead, Lake, Missoula and Mineral Counties where most of the commercial forest lands are located. Did they even look at this Lewis & Clark Conservation District Ordinance, and if not, can we consider looking at it and passing such an ordinance?

Francis Graham: I guess we could consider looking at it. I don't know whether the district could pass it without a vote of the people or not in order to change our policy. Guess I will let somebody else finish that question.

Jon Heberling: What we are getting at here is the fact that Montana, unlike the states around it, has no forest practices act. The legislature last time considered one but did not pass it and there is an on-going study to present a new one.

There are three ways that we could get at Forest Practices so that these best management practices could become mandatory, or there could be some minimum standard for logging practices near streams. First of all, we could have a forest practices act. Secondly, we could have regulation through the 310 jurisdiction of the conservation districts. Or thirdly, it could be done through rule making by the Water Quality Bureau. I think I would favor the rule making by the Water Quality Bureau.

There was an article in the paper just this past week, a suggestion by Attorney Tom France, in Missoula, of rule making pursuant to the Montana Nondegradation Standard. That means that there is to be no damage to streams, in terms of sediment, above that which naturally occurs. Naturally occurring is defined in terms of best management practices, but the regulations stop there. No best management practices exist as a matter of minimum standard. I think it would probably be best to have it done through the Water Quality Bureau because then it would extend through State and Federal cooperation to Forest Service land as well as private. This is something that many people are interested in these days.

Elna Darrow: Mr. Haag, you stated that the Forest Service uses the phrase "soil and water conservation practices" to refer to practices that the Water Quality Bureau calls "best management practices" for which it has specific guidelines and rules. It appears to me that the Forest Service terminology is specifically intended to evade that regulation. I would like your comment and perhaps Mr. Pilcher's as well.

Ron Haag: Our Soil & Water Conservation Practices include the BMP's that the state requires, but they go beyond that. Under state law (Montana Clean Water Act) there is a specific mention to BMP's. Consequently, we have chosen to use a different term so we don't become in conflict with that.

Steve Pilcher: Just as a point of clarification. The state law does not include Best Management Practices. There is reference in a couple of sections of the law dealing with the definition of "naturally occurring conditions" and what constitutes the naturally occurring conditions where a reference is made to Best Management Practices. Obviously, there are many people in both the agricultural community and in the timber community that have considerably more interest in carrying out those practices, than does the Water Quality Bureau.

The Water Quality Bureau is a part of the water quality management planning process, the 208 Process. It did attempt to put together a packet of Best Management Practices, but these were practices that were not developed, per se, by the staff within the Water Quality Bureau, but were more a consolation of Best Management Practices or conservation techniques that were currently accepted by both the agricultural community and the forestry community. They would include some of the clauses that the Forest Service includes in their timber harvest contracts and puts this information together as sort of a state-of-the-art condition for carrying out these activities. Now under Section 319 of the Federal Clean Water Act, the state will be required to, formally adopt these BMP's. And I would only point out that it is not an easy task because to put together all of the engineering standards for proper conservation techniques and proper timber harvest, you would end up with a very thick booklet. So we are trying to come up with something that is reasonable and at the same time still provide some protection to the environment that is required under Montana Water Quality Act.

Ed Brannon: I would like to say things to Jon Heberling, my good friend. First of all I would like to say that Jon, living in the Flathead Valley with you is like sharing a sleeping bag with a porcupine. There is just no way I can get through a single night without getting stuck! The hard part is, as you know with a porcupine, with the quills go in they hurt but they hurt like hell when you take them out because they always pull a big piece of meat with them. I promised myself that I would not pull out any quills at this meeting. I would wait until I could get home and I could pull them out in the safety of my own bedroom. My wife could kiss every little spot and say that boo-boo is all better now and it will go away. But I do need to respond to some of the things that you said, not in specifics but in general.

First of all Jon, even though I don't always act like it, I do appreciate the comments that you make and those of your clients. Many of the comments are very well thought out and have a lot of information. We take them seriously and are always in the process of trying to do something different and make things better. Although we are very crafty at hiding it, we try to be flexible and we have been working on implementing a number of the changes that have been suggested. There are also, to be truthful, a lot of your comments that we happen to disagree with. That's a part of the way this process goes. I did want to assure you that I appreciate those comments that you made and that we will give them serious consideration. One of the things we will do probably, at a subsequent meeting, is get into a little more in-depth discussion of some of these Forest Practices issues because it is always a hot topic in the Flathead Valley. The logging industry has been here a long time and the Forest Service has been here a long time and there is a lot of interest in it. So, I did want to say that and share that with you Jon, and give you my personal thanks and pull out one of these quills and go and sit down.

Bill Parson: Lewis & Clark Conservation District did adopt a very restrictive regulations for their particular district with respect to forest activities. None of the other conservation districts in the state have chosen to do the same. Each conservation district did have the opportunity to set up its own rules and regulations. I would suggest a change that might be necessary, with respect to 310, that in a scattered state like Montana as to what is applicable in each of the conservation districts. To give you a specific example, some conservation districts require permits for 18" culverts to be installed. Then they go to a different conservation district and they might not require a permit to be required until you have a 36" hole.

The second thing that Ben Cohen commented on was the fact that BMP's have not been adopted by a lot of conservation districts. Ben, maybe you weren't aware of this but BMP's that were recently developed by the Montana Cumulative Watershed Effects Cooperative, have been adopted by the Montana Association of Conservation Districts. So, BMP's are in place.

Wally Jordt: Last Wednesday, we were in this very room and there was a Forest Service Public Meeting. They stated that they did, in fact, make funding last year. Are they lying to us?

Jon Heberling: When I refer to a 10 million dollar loss I am referring to the Flathead's 1986 Monitoring Report where they showed 15 million dollars in expenditures, 5 million dollars in receipts, and a 10 million dollar loss. I had earlier thought that the loss was generally 3 or 4 million dollars per/year. Now there are a number of ways to figure whether there is a gain or a loss and I'm using net receipts to the treasury to measure the taxpayer effect.

Wally Jordt: Let me question the same. How many agencies do you know, that are government agencies, that show a profit?

Jon Heberling: The Forest Service is in a special situation because it has the commodity to sell, so it has the opportunity to at least break even. Unlike an agency like the Water Quality Bureau, which has essentially no income except maybe a few fines, the Forest Service does have something to sell and has the opportunity to make money. The Forest Service does make money out on the coast, in Oregon, where the trees grow about 3 or 4 times as fast.

Wally Jordt: Would you advocate shutting down any non-profit branches of government?

Jon Heberling: Ed Brannon and I have been over this a number of times and we have a number of suggestions for changing the way the Forest Service does business. We have tremendous recreational values here, but there is essentially no charge for them. A minimal charge like $2 or $3 dollars a day would bring in tremendous revenues and enable the Forest Service to do business in a slightly different way.

Ed Brannon: I want to negate the figures that Wally was referring to and share some information. This whole issue of below-cost timber sales and loosing money on the Forest Service Timber Program is not unique to the Flathead National Forest. It is really an national issue. As directed by Congress, the Forest Service had to come up with an accounting process so it could look at the costs and benefits of its timber program. It wasn't allowed to do this on its own. It had to do it with the work of the General Accounting Office. Over a number of years they developed a process and it is just being implemented right now, nationwide.

Each National Forest provides data. It has three separate reports. The first report is like a financial statement that you would have with a company; it's a profit and loss. The second report is an economic report that looks at benefits and costs on the timber program for the full rotation of 100 years and discounts them back. The third report looks at the specific impacts on local communities. Our data is only in draft form and we expect that this process is probably going to undergo some changes over time. The first report shows that in 1987, we about broke even. We did loose about 1.5 million dollars, once you take out the 25% fund required to give to the county. When you look at the amount of salvage of dead timber we did in 1987, from the Mountain Pine Beetle, we feel pretty good about that because with the additional $2.00 per/1000 board feet we would have broken even. The economic report also looks good that it is better than one cost benefit ratio. The report that is probably the most telling is the third one that looks at economic impacts on the community. Following this process, the 1987 impact on the community of the timber harvesting off of National Forest land was about 90 million dollars. Of those activities, there was about 80 million in employment and income and an additional 10-15 million in income taxes paid on that. Within the next few months or so we are going to have that report available on an annual basis, as requested by Congress. I think it will help to at least sharpen some of the arguments that Jon and I have been having about how do you account for this and how do you account for that, do you make money or loose money. The question is, the wood products industry is an important part of the economy of the Flathead Valley and I think they are certainly a boogieman today and an important partner in this and support clean water.

Ron Haag: I am not an economist so I am not going to make any comments that relate to the economics of timber harvest on National Forest Service land. There are two things that I would like to leave you with that I had to cut out of my talk because of time constraints. One, the state right now is involved in a number of efforts as related to water quality issues. You heard

Steve Pilcher speak of Section 319 and his efforts now to formulate a water management plan. Larry Fastbender with the DNRC has undertaken a similar effort. I am directly involved with the state in terms adjudication of water rights. We need an overall strategy for how we are going to manage these resources for the state.

The other thing is in context with the idea that water is more than just beneficial use. I know sometimes in our thinking we are very rational and very analytical and very logical in how we present data and information. We get caught up in that. I would also suggest to you that there is a subjective side to the water issue. It is very hard to put a dollar and cents on it, very hard to come away with some sense of a quantifiable approach of description. It's the emotional aspects of water, the idea of just having water in our streams, the idea of being able to hear a brook, the idea of being able to look at Flathead Lake on a nice sunny day. To just see the water there. Somehow, we have to capture that too in our policy and strategy in relation to water quality.

GLACIER COUNTRY: LOGGING, LEISURE, AND THE ECONOMY OF THE FUTURE

by

Harry W. Fritz

for

Flathead Basin Commission

Kalispell, MT

April 25, 1988

GLACIER COUNTRY: LOGGING, LEISURE, AND THE ECONOMY OF THE FUTURE

I'm here today in several capacities--resident of western Montana whose father-in-law lives on Flathead Lake, teacher of contemporary Montana history, State Representative from Missoula, and candidate for statewide office.

I wish I knew which hat to put on for this luncheon, although maybe it's best to keep you guessing. You can decide when I'm finished which chapeau I'm wearing.

It is appropriate that we talk about logging and leisure here in Glacier Country, which is the Montana Promotion Division's tourist title for northwest Montana.

Flathead County is its capital, and Kalispell is its nerve center.

Here in Glacier Country, the two great economic mainstays of western Montana--the timber and tourist industries--are centered.

Flathead County alone is home to 20 percent (45 of 222 in 1981) of the total number of wood products plants in the state of Montana. If we add the plants in the counties directly adjacent to Flathead, we're up to 50 percent (111 of 222). The rest of Montana can fend for itself.

Simultaneously, the local boosters tell me that Flathead County handles 25 percent of the total tourist business in the state of Montana.

That's not at all hard to understand--after we've visited Big Mountain, the North Fork, Glacier Park, Hungry Horse, and the Lake, we've got to travel a pretty far piece to find a comparable cluster of tourist attractions.

These two potent economic activities give to the Flathead a diversity shared, and then only in the best of times, by just one or two other regions in Montana. Yesterday's Interlake hyped that diversity, growth, and progress in the Valley.

It is the popular perception, with a good deal of validity in cold statistics, that these two economic pursuits are passing in the night.

That logging is the economy of the past in Montana, and leisure the activity of the future.

That timber is down and tourism is up.

That Montana, "Unspoiled and Unforgettable," is the nation's national park and Glacier Country its top roadside attraction.

Nothing could be further from the truth.

For I believe that Glacier Country is on the brink of a profound revitalization in both of its historic economic bases. We will see a new Montana arise in our second century of statehood, and Glacier Country will propel it onward and upward. The economy of the future will be centered right here in the Flathead.

Certainly this growth, expansion, and prosperity is not immediately apparent at present. Contemporary Montana seems to be in the economic doldrums, buffeted by vast, impersonal national and international financial and market forces over which we have little or no control. We're the crack at the end of the whip, and the ringmaster is standing in Washington, or Wall Street, or Tokyo, or even just north of the border.

The recent history of the wood products industry in Montana is not consoling.

Although employment figures held up pretty well in the 1970s, the industry was buffeted by successive national recessions, plant closures, and environmental restrictions.

The nadir came in 1982-83, when Montana began its worst depression since the 1930s.

The strong dollar produced by national economic policies, the lack of a housing program, and the declining number of available sawlogs have continued to hurt the industry.

Most terrifying, particularly on private lands, is a cutting rate two or three times the growth rate.

Employment has continued to decline. This travail is illustrated by the management of Champion International in my home town of Missoula. Champion is closing one mill to modernize it, and when that's done it'll close the other mill. The price? About 175 jobs. Plum Creek Lumber right here in Kalispell has cut its work force by 75, yet produces 60 million more board feet of plywood.

This is the most significant fact about Montana's contemporary corporate economy--declining employment in our traditional natural resource extractive industries.

Dennis Washington in Butte is hauling as much copper ore as Anaconda/ARCO did ten years ago--about fifty thousand tons per day--but with one-fifth the labor force.

General Mills in Great Falls increased its productivity by 28 percent--and cut its labor force by 33 percent.

And even though the wood products industry in Montana last year set productivity records in nearly every category, and corporate profits were high, the industry operated with more than 300 fewer workers than at the depths of the Reagan recession in 1983.

The Bureau of Business and Economic Research at the University of Montana has confirmed these trends.

It predicts a loss of 3,000 more jobs--about one-third of the current work force--between now and the year 2000.

The wood products industry thus highlights the fatal flaw in the modern Montana corporate economy. Technological change in every one of our traditional primary industries has enhanced productivity, and raised profits, but it has cost jobs, and lowered wages, and reduced both income and impact.

The prospect would seem to be more of the same, if we do nothing.

But we can do something. We can revitalize the forest products industry in Montana. We can put it on a different footing and point it to a brighter future.

Some things will happen anyway. A new administration in Washington, of either party, will undoubtedly curb the reckless financial policies of late which have put us in hock to foreign money and imported goods.

It will also undoubtedly inaugurate a new housing construction program.

An emphasis on domestic production for export, even if it raises prices, will have a salutary effect on American industry.

The Wilderness Bill, which is now on the table in D.C., will ultimately free up nearly five million acres of land for multiple use development, including timber harvests.

But these developments, while welcome, will merely continue a regressive pattern of logging in Montana.

More promising are efforts, some underway, some on the drawing board, and some still in the realm of theory, to create a modern, value-added, wood remanufacturing and export industry in Montana.

Already the School of Forestry at UM is focusing its research on second-growth, small diameter trees, especially lodgepole pine.

Montana has the largest stands of lodgepole pine in the nation, and nearly half of all the trees in the entire Rocky Mountain region.

The Science and Technology Alliance has recently created a "Center of Excellence" at UM dedicated to discovering secondary wood products and producing value-added prototypes.

The Montana International Trade Commission has just prepared a research report on Technology Transfers and Wood Remanufacturing in Montana which concludes that sufficient raw material exists in the resource base to permit a sizeable growth in remanufactured products.

About 80 percent of the lumber currently produced in Montana is simply cut into dimension lumber and studs.

The study concludes that Montana is ideally suited to reorient its wood-products industry to value-added manufacture and to market its products nationally and internationally.

This diversification of the industry will require active state leadership at every stage from research to feasibility studies to job retraining to sales.

But I believe that Montana has just opened the door to a transition process that can halt the current decline, rejuvenate the industry, and keep Glacier Country in the forefront of the state's timber activities.

The travel industry is also languishing in Montana, although for quite different reasons.

We didn't even know we had a travel industry until we got into a tourist war with, of all places, North Dakota.

North Dakota put up billboards on its border proclaiming that George Armstrong Custer was having a wonderful time--until he visited Montana.

Governor Schwinden responded that Custer had a party in Montana he'd never forget.

He reminded our neighbors that Custer spoke to the Bismarck Chamber of Commerce before he left, and said "Don't do anything until I get back." They've followed his advice ever since.

Anyone who finds himself in North Dakota, the Governor added, must have taken a wrong turn in Winnipeg.

Actually, by most current measuring rods, Montana travel business is picking up.

The new accommodations tax, earmarked for travel promotion, has raised the state from 49th to 24th in the nation in an area which economists say can produce instant dividends.

Already, with less than a year under our belts, the new advertising campaigns seem to be working. Out-of-state recreational visits to our ski resorts, for example, seem to be up.

Big Mountain just reported its third or fourth best year in history, despite adverse climatic conditions (no snow), with three-fourths of all skiers coming from out of state.

I'm going to resurrect an old idea of mine--to legalize casino gambling, but only at elevations higher than 6,000 feet! I guarantee they'd find something else to do with Our Lady of the Rockies in Butte.

But a few more skiers, a few more visitors, a few more cars in the parking lot at Logan Pass, are not the ultimate answer to Montana's travel economy.

We must recognize our weaknesses, and transform them into assets.

Our biggest weakness is that we do not have a single destination point tourist attraction, which can be counted on to draw thousands of people on site.

The closest approximation is Old Faithful, which we conveniently forget is in Wyoming.

Glacier Park is next, but you can get in and out of it in a day.

We can develop a travel economy. I draw a distinction between tourists, those one-day wonders who are satisfied with a beeline flight to Disneyland, and travellers, people with a little time and money who'll poke around in a Montana with places to go and things to do.

It is not sufficient merely to promote Montana. If we just advertise mountains, they'll go to Colorado.

A modern travel economy is keyed to development, and telecommunications.

We must provide quality resorts, chartered transportation, visitors centers (especially at major entrances to the state), and computerized connections to every major Montana convention center and cultural, educational, and recreational opportunity.

Here in Glacier Country we could promote, and fill via telecommunications, the most spectacular golfing tour anywhere in America.

I've heard one expert claim that Montana could support 2,000 quality resorts where visiting families would think nothing of dropping $3,000 per week.

I could funnel a quarter of a million people through Chinook, Montana (which has two motels) if I could promote and develop the Bear's Paw battleground of Chief Joseph and the Nez Perce.

In fact, the entire Hi Line, along U.S. Highway 2, is fertile ground for travel promotion--and it leads to Glacier Country.

Historic Forts Union and Buford are just across the border in North Dakota, and should be annexed.

The Fort Peck Dam, and Summer Theatre, are period pieces from the New Deal.

We boast the Medicine Like, Charles M. Russell, and Bowdoin National Wildlife Refuges.

Fort Assiniboine near Havre looks like Black Jack Pershing had just abandoned it.

Northcentral Montana boasts three great fight sites: Meriwether Lewis vs the Blackfeet on Two Medicine River, Chief Joseph vs Nelson Miles at the Bear's Paw, and Jack Dempsey vs Tommy Gibbons at Shelby.

The Museum of the Plains Indians at Browning, which needs a federal transfusion, should be our equivalent of the Nez Perce Cultural Centers at Lapwai, Idaho, and Toppenish, Washington.

And the old Great Northern hotel at East Glacier is a history lesson unto itself.

We have hardly tapped the possibilities for group travel on a national and international basis.

Montana's existent travel industry is almost wholly derivative. We have relied on the federal government, which operates Glacier, Jellystone, and the Custer Battlefield, to provide places in Montana for people to go.

The Battlefield in Big Horn County annually draws some 300,000 visitors, who otherwise would have absolutely no reason to visit southeastern Montana. Even the Big Hole Battlefield near Wisdom, in about as out-of-the-way a place as anywhere in Montana, attracts nearly 40,000 people per year.

We are just beginning to recognize what we can do for ourselves, and the future is limitless.

Both of these new departures, in timber and tourism, promise a bright economic future for Glacier Country.

But I would be remiss if I did not mention the one item that draws us all here today--the quality of the water in Montana in general and in the Flathead Basin in particular.

I'd be satisfied if we did nothing at all to improve the logging and travel industries, but did preserve and enhance the quality of Montana water.

That's everyone's concern, so quit listening to me and get on with it!

An Approach to Solutions: A Look at Case Studies

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Water Management Division
Environmental Protection Agency
Denver, Colorado

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Idaho Panhandle Health District

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Introduction, Section Moderatorc

MAX DODSON

Director, Water Management Division
Environmental Protection Agency
Denver, Colorado

Welcome to the panel, **"An Approach to Solutions: A Look at Case Studies"**. My name is Max Dodson. I am the panel moderator and Director of the Water Management Division.

We have four excellent panel members here today. I believe that all of the panel members will present case studies that have direct application to the theme of this Conference, **"Our Clean Water - Flathead's Resource of the Future"**.

The first speaker is Ken Lustig. Ken will discuss the implementation of sewage management agreement in the area overlaying the Rathdrum Prairie Aquifer, which is a management effort to control the problems similar to the ones witnessed in the Flathead Valley.

Don Peterson will give you an account of a very unique program for Summit County, Colorado. That program involves the control of phosphorus in Lake Dillon, Colorado, Denver's major water supply.

Frank Gaffney will share with you the Timber/Fish/Wildlife agreement reached in the State of Washington that is particularly germane to the issues that have historically confronted the Flathead Basin of Montana.

Jim Posewitz will complete the panel discussion with a cogent description of the process that the U.S. and Canadian Investigative Board used in reaching agreement on the transboundry impacts of a proposed coal mine in Canada.

My job as panel moderator will be to keep the presentations on time and I will reserve the right to ask each panelist at least one question.

To begin with, I am very honored to be here today. I have the additional honor of being tangentially involved in the Flathead Environmental Study that was initiated in 1978. The culmination of that study brought forth the Flathead Basin Commission. To the Environmental Protection Agency, the Flathead Basin Commission is a model for the rest of our region. Local and State institutions, such as the Commission, epitomizes the intent of the Federal Water Quality Act which for the most part relies on State and local government and institutions to be implementors.

In the early years of the Environmental Protection Agency, I may not have made that statement. The reason is that the 1972 mind-set was: if they won't, EPA will. Reality, ala 1988, has changed the mind-set. It now is if you (state/local/private) won't, EPA can't. That is a political, economic and policy statement but mostly it is reality.

As an example, the 1987 amendments has almost doubled the regulatory requirements. The Safe Drinking Water Act probably tripled the requirements. Yet resources are stable and projected to go down. Water Quality needs help. It comes from the many fallen that will be absolutely essential to protect water quality.

Let me also make an observation regarding EPA's role in water quality. This observation came out of a speech Barry Commone made on January 12, 1988, at a toxic's seminar in Washington, D.C. He asked the question, "How far have we progressed toward the goal of restoring the water quality of the environment?" The answer is, in fact, embarrassing. Apart from a few notable exceptions, environmental quality has improved only slightly and in some cases has become worse.

Successes have been in the area of air, PCB's in wildlife and humans, mercury in Great Lakes, etc. Mr. Commone cites several failures, dioxin in particular. He further states, "The lesson of both the few successes and the far more numerous failures is the same: environmental pollution is a nearly incurable disease but it can be prevented." He cites the EPA for cleaning up failure but doing a poor job of prevention.

To some extent, I agree with Mr. Commone but I also feel he has failed to reflect on the many activities that are directed towards prevention. The panel presentations today will make my point.

With that, let me introduce the first panel speaker, Ken Lustig.

PUBLIC AWARENESS AND MUNICIPAL INVOLVEMENT IN SEPTIC SYSTEM MANAGEMENT AND GROUNDWATER PROTECTION

by

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A PAPER PRESENTED AT THE
NATIONAL ENVIRONMENTAL HEALTH ASSOCIATION
THIRD ANNUAL MIDYEAR CONFERENCE
"ON SITE WASTEWATER MANAGEMENT
AND
GROUNDWATER PROTECTION"
FEBRUARY 7-9, 1988
MOBILE, ALABAMA

ABSTRACT

PUBLIC AWARENESS AND MUNICIPAL INVOLVEMENT IN SEPTIC SYSTEM MANAGEMENT AND GROUNDWATER PROTECTION

In 1976, studies of the Rathdrum Prairie Aquifer confirmed a significant increase in nitrate concentrations positively correlated with the use of subsurface sewage systems.

To protect the second sole source aquifer in the nation under Public Law 93-523, the Panhandle Health District (PHD):

> educated citizens regarding the importance of protecting groundwater to ensure safe drinking water supply, and emphasized public involvement in establishing policy;
>
> promulgated a general regulations limiting septic system development in order to discourage residential sprawl and encourage both environmentally and economically sound city planning;
>
> implemented these regulations through civil contracts called Sewage Management Agreements (SMAs) between the PHD and cities individually.

Combined, these steps have resulted in an effective septic system mangement program marked by cooperation and responsiveness to local needs.

PUBLIC AWARENESS AND MUNICIPAL INVOLVEMENT IN SEPTIC SYSTEM MANAGEMENT AND GROUNDWATER PROTECTION

by

KENNETH W. LUSTIG, M.S., E.H.S.

INTRODUCTION

Through its appointed Health Board and its regular staff members, the Panhandle Health District (PHD), based in Coeur d'Alene, Idaho, has created an innovative program for protecting the quality of drinking water withdrawn from the Rathdrum Prairie Aquifer by managing septic tank effluent. To achieve this goal, the PHD has used a combination of (i) broad policies that encourage sound environmental practices, (ii) general regulations that effectively limit residential sprawl and development in rural areas in the District, and (iii) specific civil contracts called sewage management agreements (SMAs) that govern the permitting of septic tanks inside municipalities in the District. In combination, these policies and programs have protected the aquifer by directing population growth into the municipalities, thereby making the construction of sewers and centralized treatment plants both economically and environmentally attractive.

Through these policies and programs, the Panhandle Health District has educated the public on the need to protect their sole source drinking water supply by managing waste water disposal.

The program's policies, especially the sewage management agreements, have succeeded in protecting a unique and valuable natural resource. In their own right, the sewage management agreements have proven so successful a vehicle for negotiating and sharing the management responsibilities for the aquifer that they have become a central focus of this paper.

THE SETTING AND THE PROBLEM

Kootenai County, located in the northern panhandle of Idaho approximately 45 miles east of Spokane, Washington, contains an unusual water bearing geologic formation known as the Rathdrum Prairie Aquifer. Formed by sand, gravel, cobble and boulders deposited in a valley by the action of glaciers during recent Ice Ages, the Rathdrum Prairie Aquifer is a large, deep and moving "reservoir" of water that discharges to surface water near Spokane, Washington. The rate of flow is 1,000 cubic feet per second.

Due to the extremely high permeability of the geologic formation, water in the aquifer moves at an amazing rate of up to 66 feet per day. Given the plentifulness and superb quality of the groundwater in the aquifer, it is the main source of drinking water supply, even though many clean lakes dot the landscape. Moreover, 290,000 people living over and adjacent to the aquifer in Spokane County, Washington, rely on it for their drinking water supply.

PANHANDLE HEALTH DISTRICT I

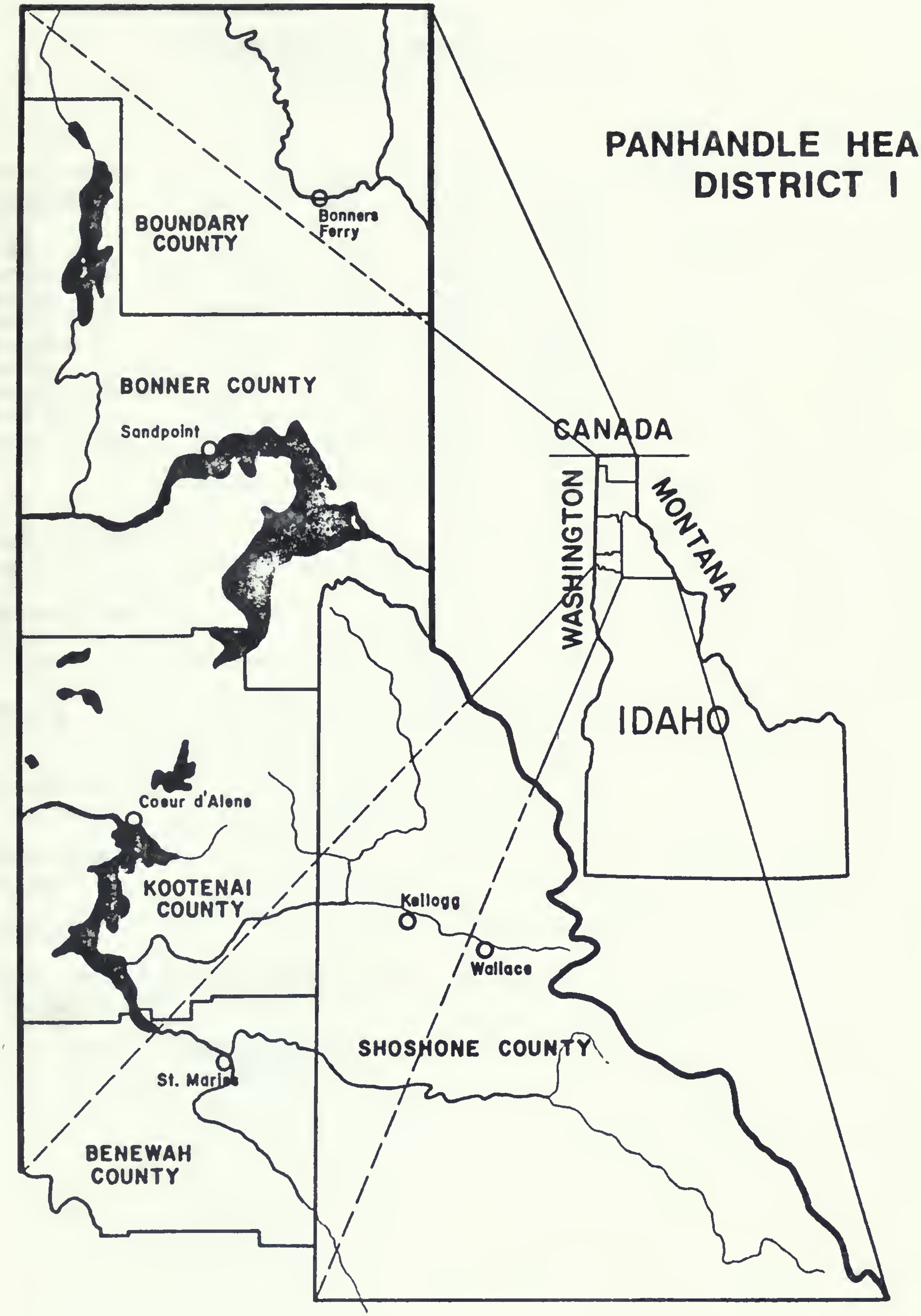


TABLE 1
MAJOR POPULATION CENTERS IN KOOTENAI COUNTY
POPULATION SUMMARY 1970-1985

Incorporated Community	1970	1975	1980	1985	Population Percent Increase (70-85)	Population Percent Sewered 1985
Athol	190	231	309	286	51	0
Hayden Lake	260	302	270	306	18	0
Hauser	349	433	306	294	-16	0
Spirit Lake	622	730	830	806	30	85
Rathdrum	741	957	1,319	1,629	120	0
Hayden	1,285	1,711	2,353	3,362	162	0
Dalton Gardens	1,559	1,867	1,779	1,955	25	0
Post Falls	2,371	4,030	5,606	6,595	178	30
Coeur d'Alene	16,228	17,994	19,434	23,700	46	60
	23,605	28,255	32,206	38,933		
Unincorporated County Area	11,722	18,168	27,564	30,432	160	0
Kootenai County Population (Total)	35,332	46,423	59,770	69,365	96	24
Housing Units	14,714	17,784	26,959	29,591		
Incorporated (Cities)	67%	61%	54%	56%		
Unincorporated (Rural)	33%	39%	46%	44%		

SOURCE:

Water Quality Management plan, Rathdrum Prairie, Panhandle Area Council, September, 1978.

J. P. Stevens Planning Associated, Inc., March, 1986.
U.S. Bureau of the Census, 1985.

In 1970, Kootenai County had a population of 35,332 in its 1,256 square miles of area. Planners projected the population of Kootenai County as 46,008 in the year 2000. Unexpectedly, the population surged to 60,000 by 1980. As the population grew, essentially all new homes installed septic tanks with leaching fields which recharged effluent to the groundwater.

For 16 months in 1975 and 1976, the Panhandle Health District, as part of a larger area-wide 208 study, monitored 31 wells in the aquifer, especially for concentration of nitrate. Nitrate, an inorganic ion, commonly appears in groundwater from anthropogenic sources, often as a breakdown product from either (i) waste water effluent containing nitrogen from the biodegradation of urine and feces in septic tanks, and/or (ii) seepage or water soluble nitrogen (ammonia) applied to crops or lawns as fertilizers. The U.S. Environmental Protection Agency (EPA) (1974) had set 45 parts per million (ppm) of nitrate measured as nitrate as the enforceable Maximum Contaminant Level (MCL) in community drinking water supplies. The PHD chose to monitor concentrations of nitrate because it is extremely mobile in groundwater, making it an early indicator of groundwater contamination, and because it is easy and inexpensive to measure in laboratory tests.

The 16-month monitoring program revealed that wells in the aquifer downgradient from large numbers of septic tanks had an average concentration of nitrate/nitrate exceeding 7 ppm, and it also showed that some wells had peak concentrations above 20 ppm of nitrate/nitrate. The PHD's Board and staff members sensed the significance of these measurements and initiated policies and programs to meet the challenge. Under Idaho legislation passed in 1970 that created the health districts, the PHD had the authority both to issue permits for septic tanks and to enter into contracts with other government agencies.

POLICIES AND PROGRAMS

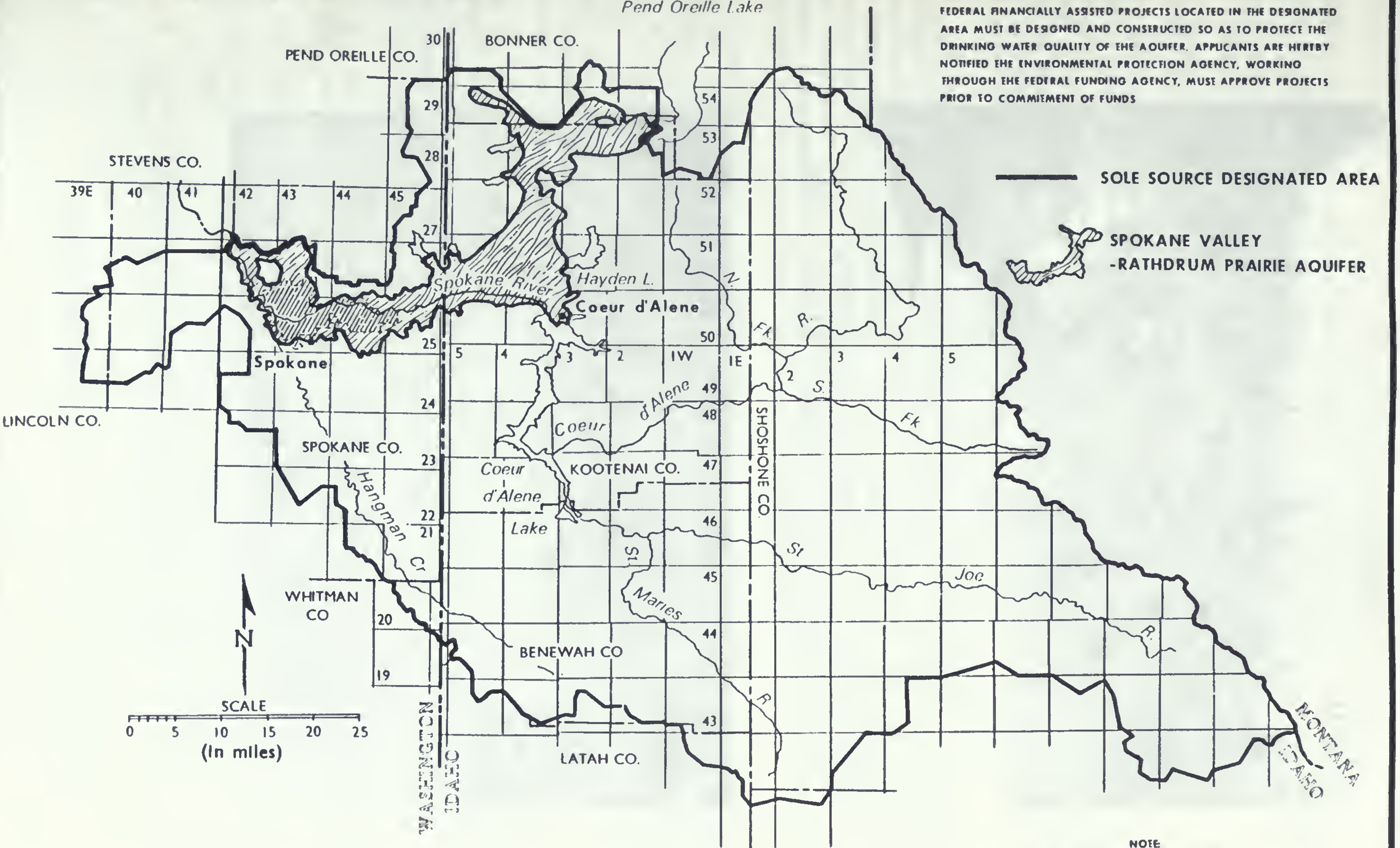
In February 1976, the PHD Board received an interim report indicating the significant increase of nitrate in the aquifer over the historic "background" concentrations (of less than 1 ppm nitrate as nitrate). Based on recommendations from a citizen Ad Hoc Committee, the Board developed regulations for the protection of the aquifer. In essence, the proposed regulations contained two primary provisions:

- o Outside the incorporated cities and towns, PHD would not grant a septic tank permit, needed for new construction, on lots less than 5 acres in size, and
- o Inside the incorporated cities and towns, PHD would grant septic tank permits as long as the municipality had negotiated an SMA with the Health District.

After nearly 2 years of hearings and public debate, the PHDs regulations became final. By implementing the regulations, each SMA, negotiated by staff members from a municipality and from the PHD, established goals, policies, and programs in the municipalities to prevent damage from septic tank leachate.

(I) COMMENTS (WITH SUPPORTING DOCUMENTATION) APPLICABLE TO PROJECTS IN THE DESIGNATED AREA ARE ENCOURAGED.

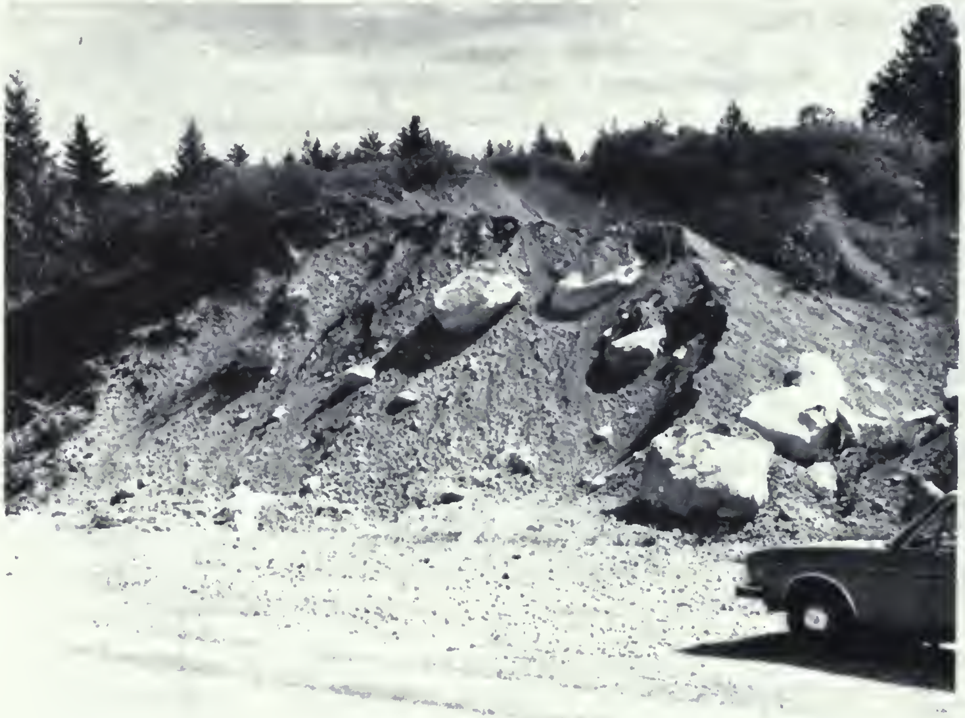
FEDERAL FINANCIALLY ASSISTED PROJECTS LOCATED IN THE DESIGNATED AREA MUST BE DESIGNED AND CONSTRUCTED SO AS TO PROTECT THE DRINKING WATER QUALITY OF THE AQUIFER. APPLICANTS ARE HEREBY NOTIFIED THE ENVIRONMENTAL PROTECTION AGENCY, WORKING THROUGH THE FEDERAL FUNDING AGENCY, MUST APPROVE PROJECTS PRIOR TO COMMITMENT OF FUNDS



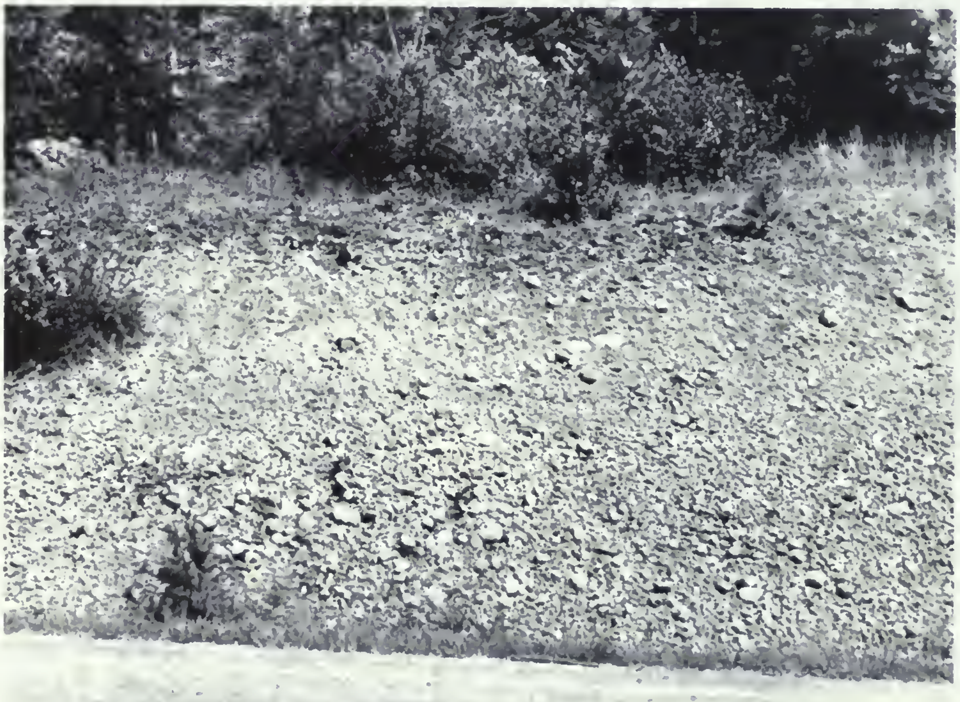
NOTE:
DESIGNATED UNDER THE AUTHORITY OF
SECTION 1424(e) OF THE SAFE DRINKING WATER ACT (PL 93-523)
(FEDERAL REGISTER, VOL 43, NO. 28-THURSDAY FEBRUARY 9, 1978)

SOLE SOURCE AREA
FOR THE
SPOKANE VALLEY—RATHDRUM PRAIRIE AQUIFER

EPA



Photograph No. 1 - Coarse deposits of sand and gravel.
Location - Borrow pit along highway 41 about 1 mile
north of Spirit Lake



Photograph No. 2 - Coarse deposits of sand and gravel.
Location - along Highway cut about two miles south
of Spirit Lake.

Photographic Plate No. 1 - Coarse sand & gravel
deposits near Spirit Lake

Most of the SMAs contain a plan to build sewers and centralized sewage treatment plants as population density grows to make such facilities both economically and environmentally attractive. SMAs, civil contracts renewed by renegotiation, can be and are tailored to the evolving, particular circumstances of each community.

BASIS OF A SEWAGE MANAGEMENT AGREEMENT (SMA)

The rules and regulations governing sewage disposal on the Rathdrum Prairie are relatively brief. Their strength lies not in detailed command-and-control language, but rather in the PHD's understanding that a comprehensive management approach is needed to protect the aquifer and that negotiated agreements can be used to achieve environmental goals. While permitting septic tanks under approved circumstances, the PHD has undertaken a long-term planning strategy to replace them when economically feasible.

The pivotal sections of the regulations are the 5-acre rule and the sewage management plan/agreement: The first section commits the Board of Health to continue issuing permits for individual subsurface sewage systems on parcels of land 5 acres in size or larger. This commitment is based on technical evaluations that such a density and its aggregate impact on the aquifer will not violate drinking water standards. The policy is consistent with Kootenai County's comprehensive planning and zoning ordinances, which calls for 5-acre minimums on the rural, agricultural portions of the prairie.

In areas with higher population densities and subject to rapid development, adverse impacts on groundwater caused by septic tank leachate have been confirmed. Continued use of subsurface sewage technology in these areas (primarily cities), without planning for sewage collection and treatment, generally lack sufficient population density to justify sewage collection and treatment. Simply to discontinue issuing subsurface sewage permits was economically and politically unacceptable and unnecessary. The Board adopted an alternative. The second pivotal section sets the conditions under which subsurface sewage systems may be issued for parcels less than 5 acres in size.

The SMA is (the second pivotal section) basically a civil contract used to establish these conditions. It is a contract whereby the Board of Health will continue to issue subsurface sewage disposal permits if a city designs and implements a suitable plan for sewage management. Establishment of an SMA proceeds in four stages:

1. The city develops a sewage management proposal along with a timetable and plan for financing its proposal (e.g., 201 Facilities Plan).
2. The city's mayor approves this proposal.
3. The PHD staff and the Board of Health receive and review the proposal; and
4. The chairman of the Board of Health signs the proposal, signifying formal agreement between the PHD and the city involved.

WHO NEGOTIATES

Although the PHD uses a general format, the specifics of each SMA require detailed negotiation because cities must agree upon specific alternatives. Preliminary negotiations always begin with a Panhandle Health District official giving a presentation to each city council outlining the aquifer study, the regulations, the logic leading to the SMA arrangement and general options available to the city. Each city either may accept a simple "one to the five" rule allowing one septic system per 5 acres or submit a sewage management proposal to the Board of Health. The first session usually ends with the city council deciding to discuss the matter among council members and/or the consulting engineer or public works department.

Generally, the PHD staff representatives meet one or more times in workshops with city personnel selected by the city council to negotiate with the PHD. For larger cities, the city administrator and city public works director participates in the workshops. For communities of moderate size, which do not have permanent public works departments, it most often is the city consulting engineer. The small cities or towns usually send two members of the city council appointed by the mayor. In the workshops, the PHD staff present and discuss the draft "model" SMA developed by the Health District and delineate components the board feels must be included in an SMA.

As a result of these sessions, the city representatives report back to their city councils with recommendations on whether to pursue SMA development. One rural town, after several workshops in 1978-79, chose not to submit a sewage management proposal and timetable. Because of its rural setting they decided that any new development in the form of minimum 5-acre parcels would enhance the city's long range goal to remain a rual community. They, therefore, chose to abide by the "one in five" rule without making a proposal that would allow greater septic tank density on an interim basis.

In the event that a city decides to pursue an SMA, a proposal and accompanying timetable are developed. Generally, city representatives have discussed specific options with the Health District. A proposal then is drafted and sent in preliminary form to the PHD for review. After review and discussion of the proposal at the Board level, the city receives comments prepared by PHD staff. Several drafts usually are presented and reviewed before mutual agreement results. On occasion, city representatives meet directly with a Board of Health committee to address some specific issue or timeframe. Both city and PHD attorneys then receive copies of the draft final SMA for review. Some cities involve their legal staffs in negotiations.

Next, the city council reviews and approves the document. A mayor must sign and forward the SMA to the Board of Health for review and approval. If the Board of Health approves, the Board chairman signs both copies and the city receives one for its records. Should either the city council or the Board of Health be dissatisfied, negotiations resume. Throughout the process, emphasis is placed on full exploration of alternatives, depending on site specific circumstances such as growth, infrastructure, or resources. Often, through "horse-trading," it proves possible to address the needs of all parties involved.

BUILDING SUPPORT

As in any negotiations, the exchange of information, clear statement of positions and full consideration of options all are necessary. Because each municipality has different circumstances and needs, the PHD must be responsive to different considerations in each case. City councils have requested that PHD staff attend public meetings arranged by the cities to inform the public of the reasons for and meaning of SMAs, as well as to answer questions. If this type of meeting takes place, it usually occurs after the PHD has given its initial presentation to the city council and before the council has selected a group to negotiate with the Health District. This is a crucial public meeting because the city council must determine the sense of direction the community wants.

It is imperative in these meetings that the PHD explain the regulations and discuss the city's options. The meetings serve the key purpose of crystallizing public opinion and defusing rumors. Generally, if opposing points of view are voiced at a meeting, the city invites representatives of both sides to participate in negotiations with the PHD. The city of Spirit Lake held a public meeting and then asked the Health District to attend several meetings with its Planning and Zoning Board to address specific concerns raised at the public meeting. In SMA negotiations, the Planning and Zoning Board acted as the city negotiation committee. In the cases of Hayden, Hayden Lake Recreational Water and Sewer District and the Kootenai County Airport, the issue of a joint sewage treatment plant required collective, as well as individual, negotiations with the PHD. This situation called for careful attention to public relations.

There are extensive presentations of the SMA concept to schools, civic groups and planning and zoning commissions. This negotiated contract option in advocated as preferable to just command-control ordinances.

MAJOR COMPONENTS OF AN SMA

The sewage management agreement consists of three major components: the stipulation section, the covenant section and the map.

The stipulation section of an SMA begins with standard contractual language. The SMA stipulates who the agreement is between and the date on which it commences. A series of clauses beginning "Whereas . . ." follow. These clauses ensure mutual agreement on certain central points. Examples include: "Whereas the Health District has legal responsibility for protection of the public health and the aquifer . . . ."; Whereas the municipality desires to utilize subsurface sewage systems as a temporary solution . . . ." These clauses allow each side to set forth its authority and position and for the other side to concur. The stipulations set the stage for an SMAs covenant section.

The covenant section begins with the words, "Now, therefore in consideration of the foregoing, the parties covenant and agree as follows." The section then spells out specific terms of performance. Examples include:

1. The municipality shall not issue any building permit unless and until the Health District has approved the sewage disposal system.

2. The municipality shall implement as a part of its 201 plan a program for the collection of suitable and sufficient rates, fees, tolls, charges, and assessments for the planning, design, engineering management and operational services associated with facilities to collect and dispose of wastewater and sewage.

3. Upon signing this agreement, a map shall be furnished to the PHD certifying the existing city limits as of the agreement date.

The covenant section is the core of an SMA and the section requiring negotiation. In addition to specifying such items as those mentioned above, it addresses:

- the responsibility to operate and maintain new community interim disposal systems;

- the connection to sewer according to approved engineering layouts and elevations (development must be accompanied by connection to wet sewer if available, or dry sewer lines must be installed);

- the length of the agreement (e.g., annual renewal or some other designated period of time).

The third and final portion of the SMA is a map furnished by the city and signed by the mayor, certifying the city limits within which the SMA applies. The city may annex land beyond the SMA boundary, but individual septic systems cannot be utilized on annexed land until sufficient progress toward desired sewage management justifies amendment of the SMA.

MANDATORY INCLUSIONS

In order for the Board of Health to meet its legal responsibilities, inclusion of some agreements in the SMA is mandatory. The stipulation section must include acknowledgement that: the Health District has responsibility for the protection and preservation of the public health under Idaho Code 39-414 and the protection of the Rathdrum Prairie Aquifer from contamination; that both parties desire to maintain orderly growth so as to prevent contamination to the aquifer from septic tank effluent; that the Board of Health has adopted, effective 11 October 1977, rules and regulations governing sewage disposal on the Rathdrum Prairie; and that 41.1.10(c)(iii) of those regulations provide for adoption of a "sewage management plan." These mandatory stipulations provide the foundation for agreement between the parties.

The covenant and map sections of the document also are essential. The covenant section must demonstrate the city's commitment to and involvement in environmentally desirable sewage management. This commitment is the keystone of the entire SMA. The PHD requires a 201 or analogous plan to ensure a city will evaluate the costs and establish the necessary fiscal mechanisms to install sewage collection and treatment facilities. The final mandatory inclusion is a map defining SMA boundaries and signed and dated by the mayor.

VARIATIONS AND OPTIONS

In deciding how to meet the PHD regulations, a city has the choice of many alternatives. It decides how to collect revenues for sewer development and how to share responsibilities for sewage management with the PHD or other parties. A city may choose to operate and maintain all new community subsurface systems or to hold the developer responsible until sewer is extended. A city may require easements or ownership of all systems. The technique chosen depends on the city and its engineer or consultant. (In any case, all septic systems must be abandoned when a sewer system becomes operational.) A city may require the Health District to refuse approval for any new or innovative system within the SMA boundary or 1 mile of it unless the system is compatible with the city's system. Several cities allow private ownership of community disposal systems until the public sewer becomes available. This allows private capital to initiate and maintain systems which later can become part of a public system when it is developed.

RENEWAL AND COMPLIANCE

The SMA generally is renewable annually; this renewal may simply be an acknowledgement by letter that the existing SMA is functioning smoothly or, should either party feel the agreement has been violated, it can allow for formal negotiations. Because development and implementation of a 201 plan usually take between 5 and 10 years, SMA renewal has consisted primarily of an acknowledgement. As the sewer plants and collection systems come on line, cities have an incentive to limit the use of subsurface systems. Cities then prefer direct connection to a sewer for new development.

Compliance by a city with an SMA means that the city completes its 201 planning and initiates construction of sewers to replace subsurface systems. As a sewer system comes on line, the city and the PHD are able to demonstrate a net reduction in the number of systems within the confines of that city. If a city continues to annex land but is not taking steps to reduce the number of individual septic systems in the ground, the District will not issue tanks in any newly annexed area. In fact, the District can, at the next SMA negotiating session, press to reduce the areas within the city where tank permits will be issued. The PHD also reserves the right to take court action under the SMA agreements with each city.

CONTRACT CONCEPT VERSUS COMMAND-CONTROL ORDINANCES

The Rathdrum Aquifer Regulations do not delineate maximum contaminant levels; they instead establish a climate where the entities can agree how to manage so as to avoid MCLs. This climate is the SMA, a civil type contract hereafter referred to as a contract versus the conventional ordinance or rule and regulation, hereafter referred to as an ordinance, which typically establishes limits.

The contract concept establishes a peer relationship between the parties; allows each to acknowledge their concerns in writing; avoid the procedural quagmire because the conditions are mutually agreed upon; is entered into voluntarily; establishes an atmosphere of mutual recognition and a valuing of the others worth.

The ordinance concept is primarily dictatorial; instills a feeling of powerlessness; makes the regulated feel manipulated; is without arbitration except for judicial interpretation; it reinforces the roles of regulator and regulated.

If one is to have true success in a program, then group participation and resolution are fundamental. The resulting success has to be a source of pride to all parties. An atmosphere that allows others to contribute to the solution and even to concede aspects not demanded, opens opportunities for more creative solutions. If all parties perceive themselves as a part of the solution, this establishes a sense of community.

Contracts allow values of minute proportions to be brought forward and taken into consideration. Ordinances, by their nature, are strict and specific.

Contracts allow the parties to talk with one another. Ordinances tend to talk at one party.

Contracts have a negotiated life expectancy that cause reevaluation. Ordinances are perpetual unless repealed.

Contracts allow parties to mutually cooperate so as to work smarter instead of harder. Ordinances can lead to creative avoidance based on the American concept of civil disobedience.

Contracts imply a feeling of mutual trust. Ordinances may imply a lack of trust.

Contracts foster cooperation because they were signed so participants can be part of the solution. Ordinances can be disagreed with and even have opposition championed on logic, emotion and changing conditions. This leads to polarization.

Contracts advocate a sense of direction, an effort to determine the carrying capacity of the system. The object being to gradually modify the sense of direction so as to avoid MCLs. Also, contracts instill a sense of mutual coercion among the participants. Ordinances are developed in many cases utilizing standards (MCLs). The MCLs do not prevent pollution and in many cases provoke a false sense of security. Standards or MCLs recognize the limits of the system and are mistakenly seen as goals to approach but not exceed.

This is not to say ordinances are without purpose, but rather to point out that ordinances alone are easier to adopt; easiest on the regulator; and tend to be construed as a "pat" answer. The ordinance should rather be seen as a specific tool that can establish a specific set of circumstances to choose from. The Rathdrum Aquifer Regulations are a strict ordinance that mandates any city that wants to continue using onsite wastewater systems must develop an SMA with the Health District. This strict ordinance demands the parties negotiate and reach an agreement. Once the contract has been arrived at, one can implement other lesser ordinances to specifically implement the contract.

In this instant, the Aquifer Regulations created a climate of opportunity. This climate allowed the needs and goals of each city to be considered and incorporated in the internal decisionmaking. Cities could pursue goals using enlightened self interest. It relieves the concept of government insensitivity. The SMAs are based on the concept of achievement and timetables rather than on noncompliance. Because the contracts are based on education, negotiation, salesmanship and openness, this helps settle public confusion and disenchantment.

CONCLUSIONS

By implementing general regulations through specific contractual agreements, the PHD has developed an innovative septic system program to protect the quality of drinking water supplied by the Rathdrum Prairie Aquifer. The regulations provide a basis for managing growth, consistent with both economic and environmental needs. SMAs between the PHD and individual cities tailor requirements to fit specific local circumstances in a way that encourages alternative proposals and cooperative thinking. Negotiation of SMAs requires case specific determinations by the PHD. They have served as an effective vehicle for strengthening local environmental management through long range land use planning.

Strong public education and extensive public participation in development of the PHD strategy for onsite systems underlie its acceptance. The PHD approach illustrates the central importance in undertaking a program of first educating the public about an existing problem and then inviting public participation to redress that problem. This process has resulted in a partnership that provides sufficient flexibility for local self-determination while accomplishing regional goals for sewage waste management.

The SMA mechanism is extremely adaptable. Other communities and government agencies may be able to apply this general method to the particular conditions of their locale in order to address problems associated with septic systems or other sources of environmental degradation. The PHD program emphasizes prevention. Environmental protection means management of diverse nonpoint sources such as septic systems, agricultural chemicals, and underground storage tanks often through land use control. Therefore, regulatory strategies that incorporate environmental protection directly into municipal planning deserve attention.

REFERENCES

1. Council on Environmental Quality. *The Growth Shapers: The Land Use Impacts of Infrastructure Investments*. GPO No. 041-011-00029-7. Washington, D.C. (1976).

2. Evergreen Associates, Ltd. and ECO Northwest, Ltd. *Panhandle Health District Sewage Management Policies and Their Effect on Development in Kootenai County*. 208 Planning Grant Report. Coeur d'Alene, ID (1982).

3. Jones, Fred O., and Kenneth W. Lustig. *Groundwater Quality Monitoring: Rathdrum Prairie Aquifer*. 208 Planning Grant Report. Coeur d'Alene, ID (1977).

4. Lustig, Kenneth W., Larry M. Belmont and David E. Burmaster. *A Case Study of Innovative Subsurface Sewage Management Over the Rathdrum Prairie Aquifer, Idaho*. Report for the Office of Policy, Planning, and Evaluation, U.S. Environmental Protection Agency, Washington, D.C. (1986).

5. Panhandle Health District I, Board of Health. *Interim Moratorium on Subdivision Approvals*. Coeur d'Alene, ID (1976).

6. Panhandle Health District I, Board of Health. *Rules and Regulations Governing Sewage Disposal on the Rathdrum Prairie in Kootenai County, ID.* Coeur d'Alene, ID (1977).

7. Parliman, D. J., Harold R. Seity and Michael L. Jones. *Groundwater Quality in North Idaho*. Open File Report 80-596. U.S. Department of the Interior, Geological Survey, Water Resources Investigations. Boise, ID (1980).

8. Prins, Christopher J. and Kenneth W. Lustig. *Innovative Septic System Management in North Idaho*. Proceedings of the 60th Annual Conference of the National Water Pollution Control Federation. Philadelphia, PA (1987).

9. U.S. Environmental Protection Agency. *Septic Systems and Groundwater Protection: A Program Manager's Guide and Reference Book*. GPO No. 055-000-00256-8. Washington, D.C. (1986).

Our Clean Water -- Flathead's Resource of the Future

Don Peterson
Commissioner
Summit County, Colorado

Lady and Gentlemens:

I've always wanted to say that, Max.

We live about 9,000 feet in Summit County and they say "if you flatten it out -- Summit County would be about the size of Texas". I'm not real sure about that. I do know that our Dillon Reservoir would probably fit into just a corner of Flathead. That gives us an advantage but it also gives us some problems. Because being smaller it gets us in trouble quicker.

Let me give you a few statistics about our County, if I may, and I do appreciate being here to share this with you. It has been very enlightening to me in light of what we have been through in the late 70's and early 80's. I must say that we are fortunate to be ahead of you in some ways. Let me share with you how we got there and why it happened much quicker than it is happening to you folks.

First, in the '80 census, Summit County was the fastest growing county in the nation. I guess when you stop to think about it though, if you take one person and add 2.32, that's 332 percent. We are the third most educated county in the nation. To me that really means we've got some PHD's on backhoes and tending bar. The base population right now is between 13,000 and 14,000. A little bit under what I understand Kalispell is. We are 80% second-home owned. We grow to 85,000 on some weekends and that translates to 3 million skier days a year -- more in our county than in the state of Utah. We have 4 major ski areas. We have 4 major towns. We are 78% federally owned. Of the remaining 22%, only 38% is developed. A lot of room.

The Dillon Reservoir was built in '63 as a water supply for Denver. Summit County is kind of a bowl shape -- it runs out to the north (most rivers you don't think of as running north, but some of our's do). Inside that bowl are all these water sheds that drain toward Lake Dillon and a smaller reservoir called Green Mountain. The only hole that runs east is a pipeline under the mountains toward Denver called the "Robert's Tunnel". It is a water supply for Denver. But the reservoir is also a recreation and economic amenity for us, and as a Commissioner, we need to protect that resource as much as we can.

About in 1982, the state, through our Water Quality Control Division, set some limits on our sewer plants. We didn't agree with it. It was a growth trap. They had used parameters of existing discharge permits for phosphorus, as an example. And all the reports said that phosphorus was our controlling element, much as it is here. You do need some nitrogen to trigger it, but phosphorus really is the one -- there is usually more nitrogen as in the case of your lake to make the algae start going. We knew these regulations were coming and we got smart enough to put a very sharp County Manager named Bruce Baumgartner on the Water Quality Control Division. He has been it's president for the last 3 or 4 years. Bruce was able to tell us as Commissioners, and the Districts, and the Towns, what was happening, what was coming down the pike. In 1981, this is before the state really had set those regulations, we formed a Summit County Water Quality Commission. This was made up of a group of the water/sanitation districts, the towns , the County, the Game and Fish (Wildlife) Service, the Forest Service, to figure out what we were going to do next. Here they came in a put a growth cap on us and we knew it was not right, and growing as fast as we had, that was a real stimulation to get moving and get something done. The Summit County Water Quality Committee met once a week for six months. Out of that was born a clean lake study, much as what you've been through only we had more specific things in mind obviously, and one of them was to get control over what they had done to us on our discharge permits for sewer plants. One of the first things that happened was that Copper Mountain, the area that I had helped build, was short on a phosphorus allocation. Max's boys slapped a $145,000 fine on them. We loaned them some phosphorus from our County allocation. That was before we went to the state and got our allocations reset. But we loaned them some phosphorus and got them out from under it to give us some breathing room and to give them some obvious breathing room from paying a fine for violating their discharge permits on phosphorus.

The clean lake study started in 1981. It finished up in about 1983, and a major portion of the work was done in 1982. We used Western Environmental Associates -- Dr. Bill Lewis. Dr. Jack Stanford, and fellows like Dr. Bill Lewis, and the Gray Water Institute don't all agree on how to approach some of these things. They don't all agree on what the causes are or what the answers are to stop them, if you need to do that. Now I recognize that. There are experts who don't agree with each other constantly. As a matter of fact, on the Water Quality Committee we decided to fund this thing ourselves -- don't go the state legislature. I'm glad you all did that, but on the other hand, it could also be a noose around your neck if they don't fund it. You might not get as much done until you take it into your own hands. Here is what we found out of our mass balance and Dr. Jack has put a slide up here that shows you what the percentages were. Here is what our's turned out to be in our bowl up there: Natural Background is at 32%, of which precipitation is 13%; our Point Sources which is our plants is 17% (and that tracks with what Dr. Jack has found) and our industrial is only 2% because we have very little industrial up in our country of any sort. The Human Induced Non-Point is 36%. Now at the first blush, when you look at the Kalispell situation, and I have heard them take some criticism over this situation, you are attacking the low end of the scale. Seventeen percent of phosphorus due to sewer plant discharge. That is also a most expensive part of the scale to tackle probably. I think it is something you probably ought to think about a little bit. The one thing you need to do, in my opinion, and I would fund it locally. Have Dr. Jack, Stanford, do segmated streams studies of Ashley. Find out where the real sources are. We've been into that -- what we call a phase network on these streams that feed Lake Dillon. What we're finding out is that above Keystone Ski Area, as an example, we've got pretty much natural background phosphorus. Background from erosion type of things and from runoff of snow -- the atmospheric type. The minute you hit Keystone, you start running into more phosphorus and it accumulates as it goes past the areas and through private parking lots, and those kinds of things -- and incidentally, it's before our waste water treatment plant so it's not tainting the picture at all -- the Human Induced side will tell you what is happening in these stream segments. And where do you go to attack it? That's very important I think for you to think about. And since your worse perpetrator apparently is Ashley, that's the one, in my opinion you need to sample first.

In the 1982 study, we established 10,162 lbs. of phosphorus in the lake as a target. And that was an average water year from runoff. Be careful. In 1984, we dumped 19,558 lbs of phosphorus in Lake Dillon. The lake was cleaner than it ever was before -- it flushed. The top layers of that lake, that support, the algae growth, the final phyto planktons and all the neat other things they call them, were pushed pretty much over the spill way. What I'm telling you is a little bit what Kent was talking about. Regulations are neat, but don't put yourself into a box. The one thing this helps us with in future growth into the 2000's is that we can go to Max's group and say "looky! We dumped 20,000 lbs. into that lake and it didn't hurt it a bit", maybe. One thing I suggest to you, we were fortunate in that No. 1 in my opinion, we were not funded or created by the legislature. We had and knew we had to pick a neutral party to run this show. We happened to pick our Northwest Council of Governments, and I'm not sure if Montana has that kind of thing or not, but it is a governmental group that acts as a liaison between cities and towns and the state and even federal programs for six counties in Colorado, in our case, the Northwest Council. They were our neutral group. We used them to steer the process so that all the special interests were heard but didn't over balance it. I think you have to be very careful in this process that you are going through and the Flathead Basin Commission is striving very hard to do that. It depends on how people perceive you. If they perceive it as a flaming environmentalist side or pro-development that wants to pave the world, you've got problems. You're not going to get things accomplished. So maybe some of the ideas that I've heard floating around about restructuring the commission a little bit may not be all that bad of an idea. Be sure you get somebody who is neutral and who doesn't have an axe to grind to help steer you in this process.

The one thing we did was establish a budget on the monitoring of the lake, the ongoing monitoring after the study was done, and it's funding formula that really had to do with effluent. The towns and the districts had the most to lose besides the rest of the population of our growth, but based on effluent is where we did the funding for the budgets we established for ongoing monitoring and all the things that needed to happen. There are several ways that you can do that obviously. We get into sales tax kinds of issues when you get into population kinds of issues, all kinds of different ways to think about funding. We just happened to think of the effluent side because the major players were the ones that were going to be the most effected by the growth cap. The state approved our limits in 1984 and they also approved a trading process -- first in the nation. I like to think of Dillon and Green Mountain, both, as a reverse bubble from the air pollution studies and their concepts. A reverse bubble to me is that we put a bubble over the lake and say "no more is going to enter". Now, you guys can trade around things out within the parameters, but nothing else is going to enter that bubble. Air pollution doesn't work quite like that. They trade within the bubble, but if you want to put a bubble over the whole county, I guess that would work. But I like to think of it as a reverse bubble. The rules for the trading -- there are several of them, and I only want go into some major ones. One is "Two For One". If you build a project that reclaims two lbs. of phosphorus, you get one pound of credit. Mostly for your sewer plants or septic systems, or whatever. We've got a rule that says, basically, "if you don't pay you can't play". All of our entities belong to the Water Quality Group and all of them sort through these problems. It has got to be a cooperative effort and if you drop out, and run into trouble, it costs you what your dues were in a sense to get back in for the period of time you were gone. Another thing you had to do was pass regulations. Most of them were fairly uniform because we started out with a set of guidelines of what we were looking for. Those kinds of regulations regulate construction disturbance. If you see muddy water, you can bet you've got a both soluble and particulate phosphorus in it -- erosion control. Simple things -- bales of hay around a construction site as filter fences, percolation pits in some instances, new construction has detention ponds in their parking lots before it ever leaves that parking lot to help control phosphorus. The other thing is that the phosphorus trading only counts if you are talking about pre-1984 cleanups. With the new regulations in place, you pretty well have your future held or at least you have a direction and you are doing things. So to qualify for the "Two For One", that means controlling the runoff from some of our county roads. That means revegetating some of the banks and road cuts that we have in the high hills. In your case, that could mean revegetating and channeling the water flows from old logging roads that are causing problems. You must remember that one of the biggest sources is that background runoff and then, induced human problems.

The other thing you need to do is to set appropriate levels in the mass balance for your lake. That has to do with perception as much as anything.

You can regulate that point source plant and tell it "no no, you can't put more phosphorus in there than what we've told you that you can". But it is such a small part of the picture that you need to be careful. If you're not mandated like we were starting to be about the number of pounds. that can go into Flathead, then esthetics and economics are going to take over. What's in the water that you look at that doesn't really offend you. You end up between the oligotrophic and, the high end of it, and the eutrophic range in this mesotrophic range, there is only your range of what you can stand in the way of algae. That secchi disk depth, that you heard earlier this morning which tells you how far down you can see. It's important to set a limit, if you're going to, on this lake of how many pounds you are going to let in it. And as I say, be careful, because things change. It may not be the right number, but you've got to start somewhere.

Let me tell what the effects are. We have a Senior's Center that wanted to build right outside the town of Frisco. They will have to bore under the interstate to connect to a sewer system or, since they don't have a phosphorus allocation, they've got to build one. That's tough. The project is topped for the moment because of the cost of the construction. Another thing that happened -- a developer came in with a new subdivision. In the planning process he wound up having to design a large leach field that's replaceable. It's monitored and when it's phosphorus level starts to -- in Colorado we use 2 milligrams per liter as one of the measurements, here you are shooting for 1 mg/1 but in the secondary treatment of a leach field, two milligrams per liter is our target, if it goes beyond that, in the monitoring as near as they can monitor phosphorus in wells, he has to replace the leach field material. What he had chosen to do, was to build three separate leach fields and then rotate them. That's expensive but it works.

There are really two kinds of trades. There's between the sources -- by that I mean you do need erosion control things, you do the nonpoint sediment basins if you will, or other control projects. And, incidentally, what we did in our sewer plants with sludge disposal, as an example (it's a real problem in the winter time to land apply, nobody really likes brown snow) so we have contracted with fertilizer people over in the front range, in the Denver area, to haul sludge from our plants over there and apply it to fields and crops. It's a damn good way to get phosphorus out of your county. I don't know if you have another county that would like that sort of thing, but, the other thing is that the hole in the wall, the pipe that goes from Dillon to Denver, we negotiated an agreement with them to be able in the future to put effluent directly into that tunnel -- sewer plant effluent. I don't know if we'll ever need to use that because our plants are operating at terrific efficiencies. The other kind of trading is between agencies. For instance, if the Breckenridge Sanitation District runs across a project that saves some phosphorus and they built it, they've got an extra amount of phosphorus that they could allocate to somebody else if they were in trouble or coming on a growth problem. So inner-agency is an important trading function, once you've set limits on the lake that is -- that's what drives it.

The other part of it is there is a question that you need to ask yourself and in the case of Evergreen is a good one. Let's say you set some limits on the lake and let's say that. We in Colorado as Commissioners have the right to impose a district on people if we think it's in their best interest. Now that's a hell of a powerful thing and we do it very cautiously. In the case of Evergreen, if they were to build their own sewer system and the owners pay for those sewer systems, they would have phosphorus credit that now is not reaching the lake but rather going through the plant which is more efficient in taking out phosphorus. Who does that phosphorus credit belong to? The people that built it? Or the Sanitation District? This is really creating a property right that has some market value particularly in future growth that you want to watch out for, in answer to that kind of question.

Where does it go? I once had a little gal from Texas say "Fred, -- don't know how she knew my name was Fred, but she said -- life's bitch and then you die". You've probably heard that expression. Phosphorus is a lot like that except it really doesn't die in its cycle. It certainly qualifies on the other end. You need to figure out where it is going to go. A land fill - if you build detention ponds and what not - figure out where it is going to go because it's going to wind up right back in your lake and rivers if you don't watch out how you dispose of it. Measurement is really tough. A lot of thought needs to be given to how you measure how much phosphorus you save. The mass balance and testing and monitoring of the lake is probably one of the best as far as seeing what the health of the lake is and how you are doing. Currently, in our Summit County plant, (it's really not a County plant, we sit on their board of directors, and the rate payers pay for the plant.) We've let that Superintendent, Buck Wenger, experiment as much as he wanted to about this phosphorus business. He's got that plant operating now at .01 milligrams per liter of phosphorus. You're looking at 100 times less phosphorus. Our County allocation of phosphorus poundage - we've solved our growth problem with the plant operation. We've let them experiment with secondary treatment too, which I'm sure is what Kalispell is into. They are able to get that down to 1 milligram per liter -- what you're shooting at for regulation, but playing only with the secondary system. Interesting clarifier design.

I sure want to wish you a lot of luck. I hope we can be of some help to you in your endeavor. It is a very important thing that you are doing. It has very far reaching effects and we really want to wish you the best to get it done.

Timber/Fish/Wildlife-From Conflict to Consensus

by Frank L. Gaffney
Project Director
Northwest Renewable Resources Center

The original Forest Practices Act in Washington state was passed in 1946. This law pertained exclusively to reforestation. The current Washington State Forest Practices Act was enacted in 1974. It was, in part, a result of the widespread concern over the effects of clear cutting and the environmental awareness movement of the 1960's and early 1970's. It established a Forest Practices Board made up of representatives of industry, state government, and the public at large. It was given the authority to promulgate regulations which governed forest practices activity on all state forest lands and on private land for the protection of public resources. Regulations adopted as a result of the Act, were revised by the Forest Practices Board in 1975, 1977, 1982 and again in the spring of 1986. Each set of changes touched off a new round of conflict with the obligatory charges and counter charges exchanged among the interests involved. The Forest Practices Board continually found itself faced with conflicting testimony from scientific experts representing one side or another. The Board was forced to render decisions based on technical information that was, at least, incomplete; and in most cases, bitterly disputed. The proposed 1986 regulations were no exception. Several years in the making, and with the involvement of many of the most interested parties, they were termed unacceptable to some, and a disaster to others. Proposed riparian regulations were classified as not strong enough to the tribes and to some state officials. Other state officials and environmental groups pointed to the lack of protection provided for wildlife and vowed to be back with a new set of proposals to meet their needs. Industry representatives viewed the proposals as potentially having a $50 million+ negative impact on their operations--not exactly the atmosphere for solving problems.

The Tribes

I think it is important at this point to reflect on the role of the Treaty Indian Tribes in this process and the events leading up to it. In the 1960's and early 1970's, Washington and Oregon were the sites for continual battles between the states and the tribes over tribal rights to harvest salmon and steelhead. In February 1974, Federal Judge George Boldt ruled that the Treaty Tribes were entitled to harvest up to 50% of the available salmon and steelhead returning to their usual and accustomed fishing grounds. A similar decision was reached in Oregon by Federal Judge Robert Belloni. In July 1979, the U.S. Supreme Court upheld the Boldt decision. In the second phase of the Boldt case, another Federal judge ruled in September 1980 that the tribes had a guaranteed right to protection of fisheries habitat so they have the ability to make a moderate living from fishing. The forest products industry, as well as a number of other folks, certainly took note of that decision--as did the environmental community, which had strong ties with some of the tribes. Boldt Phase II remains under review, but there has been a basic unwillingness to pursue the question judicially, at least by industry, because of the tribes' almost perfect record on these matters in the Federal Courts.

The tribes, on the other hand, were not pleased with their situation. While the court victories continued to pile up, tribal fishermen were still getting very few fish, partly because court decisions must be implemented by other parties. Each court victory was very expensive for both sides, with little measurable result. Something drastic had to be done.

Industry--not just the forest products industry--swallowed hard when it looked at the habitat protection language of Boldt Phase II. They were faced with basically four options:

Litigation--no guarantees

Status Quo--uncertainty

Federal Legislation--to abrogate the treaties, not likely

Negotiation--also uncertain, but at least you were at the table

Industry chose to negotiate. Several large natural resource industry companies and financial institutions joined together as the Northwest Water Resources Committee (NWWRC). Over the next several years, its member companies negotiated several mutually acceptable agreements over land and natural resource usage with their tribal neighbors. Although that organization has dissolved, those cooperative relationships remain today.

Later, in 1984, the State of Washington announced that it would no longer litigate salmon management. Assisted by the Northwest Renewable Resources Center (NRRC), the two parties set about to negotiate a management plan to jointly co-manage the salmon resource. This new atmosphere was infectious.

The United States had been trying to negotiate a salmon treaty with Canada for nearly 20 years. Quite frankly, the interested parties in the lower 48 were so busy fighting with one another that they were unable to force agreement with Alaska, to even be in a position to sit down with Canada. Over 80% of some runs of Columbia River salmon were being harvested in Alaska. Working together for the first time, in 1984, an uneasy coalition of state and tribal officials, sports fishermen, some non-Indian commercial fishermen were able to reach agreement on the components for the U.S./Canada Salmon Treaty. The benefits of that agreement are swimming up Northwest rivers each fall.

It is not just a coincidence that the U.S./Canada Treaty was signed, and salmon runs started to rebound during the period after the Northwest Renewable Resources Center became involved.

Northwest Renewable Resources Center

The Northwest Renewable Resources Center was founded in the spring of 1984 by leaders from industry, the environmental community and the tribes. Conceived by Seattle attorney Jim Waldo, the Center provides a forum to discuss natural resource issues before they reach "critical mass." An advisory committee recommends issues to the staff to be researched and developed for proposal to the board as projects. Advisory committee members also come from industry, the environmental community, the tribes, the academic community and government.

The Center provides negotiation and facilitation services in conflicts arising over natural resource use and management. The Center's first project, the Joint Management Project, was mentioned earlier. In this project, the Center provided assistance to Washington state officials and tribal leaders in developing a salmon management plan. As an example of the effectiveness of this approach, consider these numbers: In calendar year 1983, there were 70 some separate court actions between the state and the tribes over fish. In 1984, the year the Center was founded, there were none. In 1985, there were six. The number has not reached double figures since then.

So it was no real surprise in May of 1986 when Bill Frank, Jr., Chairman of the Northwest Indian FIsheries Commission, an organization which provides coordination and technical services for the twenty western Washington tribes, contacted Stu Bledsoe, Executive Director of he Washington Forest Protection Association, an organization which represents the major industrial timberland owners in Washington, about the proposed forest practices regulations. They asked each other: Why not try to reach agreement ourselves on a system of forest land management? Why not contact Jim Waldo of the Northwest Renewable Resources Center? We both know that the Center assisted the state and the tribes in developing a joint salmon management plan.

The next month was spent convincing state agency directors, other timber company executives, and the rest of the tribes that something could be gained by sitting down with their adversaries and discussing the issues. Representatives of the Washington Environmental Council (WEC) and the National Audubon Society were invited to represent the environmental community. These organizations were chosen because they were both active in forestry issues, and had both sued the state for past activities.

It was not an easy decision for the environmental groups either. Many of their leaders felt that they were being invited into the lion's den to get rolled.

On July 20, 21, and 22, the Center invited 45 people to Port Ludlow, a resort community near Port Townsend on the Strait of Juan De Fuca. It was the same location where the Center had taken the state and tribes for the Joint Management Project. There where no telephones and no interruptions, and some would say, no sleep. The facilitation team was led by Jim Waldo, Chairman of the Center's Board of Directors, and included myself and Connie Miller.

Invited were representatives of four state agencies (the Departments of Wildlife, Natural Resources, Ecology and Fisheries), many of the major forest products companies, the Washington Forest Protection Association, the Washington Farm Forestry Association, representatives of the two dozen Indian tribes, and, as mentioned earlier, WEC and Audubon--too many people for something like this, but you couldn't leave anyone out.

The ground rules were accepted by all participants. (A copy of these ground rules will be printed in their entirety in the proceedings from the conference.) Basically, the participants agreed to focus on real goals and needs, not postures. Each agreed to listen to one another with respect. Anyone could leave at any time during the negotiations, but he/she had to stay long enough to let the group try to address his/her problem. The one rule that is not listed in the ground rules was stated at the outset of the first session. There would be no votes if a negotiated agreement was pursued. All decisions would be by consensus of the group, win/win, not win/lose. Everyone was going to have to search for areas of common interest and be flexible. Everyone was going to have to give to get.

The Port Ludlow group was a mix of policy and technical folks. Each individual was given ample time to express the goals and needs of the resources or from the perspective of his/her constituency. Smaller groups developed joint resource goals statements for water, timber, fish, wildlife and the tribe's cultural and archeological resources which were read to the groups. Every statement was recorded on a large sheet of butcher paper with a marking pen and hung on the wall for all to look at for the two days.

The Washington Environmental Council read a statement declaring their strong commitment to the fish, wildlife and water resources of the state. They also shocked industry representatives by stating that another of its goals was a viable forest products industry with a commitment to the land base. WEC reasoned that a properly managed forest was far better protection for those natural resources that it held dear than converting that land to another use through over- regulation.

The subject of roads also proved to be an early surprise. Forest land roads were identified by many as the single largest source of sediment in streams and rivers. Unrestricted use of forest roads by poachers were of concern to wildlife interests. Industry, too, talked about its goal to minimize the number of miles of forest roads. Besides the potential liability roads created, they were expensive to build and expensive to maintain. Also discussed were the hundreds of miles of old roads and railroad grades of uncertain ownership built prior to the Forest Practices Act. Suddenly, the atmosphere started to change. Everyone talked about the tremendous expense and amount of energy it had taken to reach this point in a situation that everyone was so dissatisfied with.

Environmental representatives spoke of having made virtually no gains in the ten-year battle.

Industry spokesmen talked about being nibbled to death and being unable to forecast with any predictability--because the regulations were being changed constantly.

State regulators complained of being caught in the middle and of being understaffed, partly because as long as the battle was on, the Legislature felt reluctant to appropriate funds to try and hit a moving target.

Could there possibly be a better way?

At the end of the 2 1/2 days of testing new ground and a lot of listening, the participants agreed by consensus that they perceived enough opportunity for success to recommend to their constituents trying to reach a negotiated agreement under the guidance and ground rules as proposed by the Northwest Renewable Resources Center. The proposed 1986 regulations and EIS were scheduled for release in late November or early December. Agreement had to be reached by then, or the state would proceed with the public hearings on that proposal. This deadline was a very important incentive. The Timber/Fish/Wildlife (T/F/W) group, as it was now calling itself, was divided into two sections. A technical group, called the Working Group, would look at all of the contentious issues and try to reach a consensus approach to deal with them. That consensus would be presented to the Policy Group for their approval. THe Policy Group was composed of agency directors, company executives, tribal chairman and the like. If the issue could not be resolved at the Working Group, it would be taken to the Policy Group for guidance, or for them to decide the issue. Resource goals were established covering the resources of interest: Fish, Timber, Wildlife, Water Quality and Quantity, and Tribal Cultural, Archaeological and Cultural Resources.

The Working Group split into Subcommittees--every interest was represented on each subcommittee. A brief summary of their activities:

All issues identified at Port Ludlow were dealt with by a subcommittee.

All meetings were facilitated by NRRC.

Minutes for each meeting were recorded, typed, and distributed to each interested participant.

Subcommittees met from 3 - 15 times.

The Working Group met at least twice monthly.

The Policy Group met once a month.

The Forest Practices Board was updated in August and October on the progress of the negotiations.

It was a tremendous amount of work for all involved.

In some respects, the Center drove the process with the paperwork. No one could have attended all those meetings, but anyone who wished received copies of the minutes. This way, everyone could keep up with the progress of negotiations.

By the time the final agreement was reached, in all, there had been over 100 meetings.

December approached and much progress had been made. A few items remained unresolved and some were so interlocked with others, that they had been kicked ahead, to be dealt with as part of a package. Some agreements had been reached, however.

The agreements reached by Thanksgiving included the following. Regional differences would be recognized. The new system would be flexible, with alternatives to operating solely under regulations.

Where consensus regulations could not be reached, process would be substituted with fixed review periods.

The whole system would be dynamic and adaptive, with cooperative research, monitoring and evaluation providing the information for future change.

The final negotiations began at 9:00 a.m. on December 2nd and lasted until 12:32 a.m. the following day, when agreement in principle was reached.

A Draft Agreement in Principle (A.I.P) was prepared by the Northwest Renewable Resources Center and submitted to the Forest Practices Board on December 15, 1986. The Board had been supportive of the negotiation, but somewhat skeptical. Upon reviewing the A.I.P., however, they congratulated the T/F/W participants and directed staff to begin the process of drafting regulations based on the T/F/W approach and to begin preparing for public hearings on the new system.

The final T/F/W agreement was published February 17, 1987. New regulations and an E.I.S. were prepared by state officials with assistance from T/F/W participants. While the Forest Practices Board was somewhat skeptical of T/F/W at first, a very positive state-wide series of public hearings in the summer of 1987 made the answer easy. They approved the package in November, 1987 and it became effective on January 1, 1988.

Public response to the agreement, at first, was likewise skeptical. The negotiators had committed to keeping their constituencies posted on the progress of the negotiations, but the pace of the process had been so intense that this objective had been difficult to accomplish. They were enthusiastic and supportive of the accord, but many of them were way beyond their constituents' comfort level. However, the Washington State Legislature was also faced with the unusual situation of having all these former adversaries come before them, jointly promoting T/F/W and seeking public funds to implement the agreement. While the Legislature ultimately appropriated $4.5 million of the $6.5 million requested, the bills made it through both houses without a dissenting vote and without a word change. I am sure this was a lesson on the power of cooperation for the participants as well.

The challenges of implementing the new system will probably be greater than the negotiations. It should be very helpful that industry has spent 1987 voluntarily complying with the intent of the agreement. The T/F/W participants continue to meet, although their structure has been modified somewhat.

The Policy Group continues to meet two or three times a year or as required. They have created an Administrative Committee to work with the implementing agencies. They meet every six weeks or as required. All parties are involved in developing and implementing an ambitious research and monitoring program to measure the effectiveness of the agreement. And the agreement is working on the ground. An extensive training and education program has taken the T/F/W spirit and expanded it far beyond the negotiators. Obviously, there have been some problems, but the problems are being dealt with by people with a new found respect and appreciation of each other's needs. The T/F/W negotiators are convening the last week in June this year for their first annual review to discuss what is working and what needs more work. The Center has stayed involved throughout implementation and will convene that review.

So what can I leave with all of you here today? Well, to quote Bob Duncan, Chairman of the Northwest Power Planning Council, "Cooperation leading to small but significant progress is always more difficult than angry confrontation that produces nothing."

Certainly the professional and personal relationships growing out of the T/F/W negotiations are a permanent lasting benefit, more important than any of the words or regulations.

Conflict is normal. We all experience conflict in every area of our daily lives. Natural resource decisions often lead to conflict because those decisions may be irreversible. These conflicts are generally resolved through a legislative or regulatory process. These processes generally consist of confrontation followed by compromise. Reaching accord is difficult because decision-making mechanisms are so different. Government and industry tend to make decisions based on technical and economic considerations. Citizen and conservation groups tend to make decisions based on environmental and social considerations. Government and industry have vertically structured chains of command. Conservation groups and tribes tend to have a lateral or bottom up decision-making process. Interactions are formal, usually through prepared testimony. This means we tend to see each other at our worst, advocating extreme positions to influence others. This system also fosters little respect or trust between conflicting parties. And unfortunately, legislators and regulators have been known to make decisions based on the strength and presentation of the advocate, not the merits of the testimony.

Litigation is also commonly used to resolve natural resource conflicts, and in some cases, it is the only way. However, it is expensive and can exclude those who cannot afford it. It often takes too long, and legal outcomes deal with effects of disputes, not their symptoms. Finally, legal decisions must usually be implemented by others, which means more time will be required before any changes take place on the ground, even if you "win."

Natural resource leaders in Washington state have found that negotiations can be an excellent alternative to the methods just described. The parties must be willing to negotiate, and a firm deadline established. It is essential to have a skilled mediator or other neutral third party to act as the catalyst to keep things moving.

Negotiations can fail just as easily over bad process as over bad substance. The participants in the Washington state negotiations have all indicated that the selection of the mediator was critical to their success.

I would like to leave you all with this thought. Our society has tended to view negotiations as a last resort. When you are down to your last silver bullet and your opponents are closing in, it must be time to negotiate. It is risky to agree to sit down and listen to and be honest with your adversaries. But under the right conditions, negotiations can unlock the collective creativity and flexibility of those at the table and provide lasting, reasoned, consensus answers. On behalf of the Northwest Renewable Resources Center, I thank you for inviting me, and I wish you the best of luck in planning for the future of the Flathead basin.

Northwest Renewable Resources Center

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Ground Rules for T/F/W
A Better Future in Our Woods and Streams

Each of the participants in these discussions agrees to the following ground rules:

1. We will attempt to develop a system which provides:
    a. minimum guarantees for everyone,
    b. incentives which maintain and enhance timber, fisheries and wildlife resources, and
    c. future flexibility, accountability, better management, compliance with regulations and resource goals.
2. All participants in the negotiation bring with them the legitimate purposes and goals of their organizations. All parties recognize the legitimacy of the goals of others and assume that their own goals will also be respected. These negotiations will try as much as possible to maximize attainment of all the goals of all the parties.
3. This effort will receive priority attention, staffing and time commitments.
4. The same priority will be given to solving the problems of others as you would give to solving your own.
5. A commitment is made to listen carefully: ask questions to understand and make statements to explain or educate.
7. All issues identified by any party must be addressed by the whole group.
8. Needs, problems and opportunities, not positions will be stated -- positive candor is a little used but effective tool.
9. A commitment is made to attempt to reach consensus on a plan.
10. A commitment is made to be an advocate for an agreed upon plan.
11. Participants will protect each other and the process politically with their constituencies and the general public.
12. Weapons of war are to be left at home (or at least checked at the door).

13. Anyone may leave the process and disavow the above ground rules, but only after telling the entire group why and seeing if the problem(s) can be addressed by the group.

14. All communications with news media concerning these discussions will be by agreement of the group. Everyone will be mindful of the impacts their public and private statements will have on the climate for this effort.

15. No participant will attribute suggestions, comments or ideas of another participant to the news media or non-participants.

16. In the event this effort is unsuccessful, participants are free to pursue their interests in other dispute resolution forums without prejudice.

17. Participants are free to, and in fact are encouraged to, seek the best advice from people who are not in the room.

18. All of the individuals who are participants accept the responsibility to keep their friends and associates informed of the progress of the discussions.

19. Participants agree to check rumors with facilitation team prior to acting.

FLATHEAD RIVER INTERNATIONAL STUDY BOARD
PROPOSED CABIN CREEK COAL MINE

SLIDE PRESENTATION

by Jim Posewitz
U.S. Co-chairman

prepared for
THE FLATHEAD RIVER BASIN COMMISSION
April 25, 1988

INTRODUCTION

When the Flathead River Basin Environmental Impact Statement was written, it identified the Cabin Creek Coal Mine as the major threat to the water quality of Flathead Lake. On February 21, 1984, the government of British Columbia announced that approval-in-principle had been granted to Sage Creek Limited for the proposed coal mine at Cabin Creek. In December of 1984, the United States Department of State referred the issue to the International Joint Commission for examination. This referral was done pursuant to Article IX of the Boundary Waters Treaty of 1909 that is in effect between the United States and Canada. The International Joint Commission in turn appointed the Flathead River International Study Board (FRISB). This Study Board has been at the task of evaluating the mine and its impact on water quality and fisheries for almost three years. The Board report will be issued in the near future. The following "colored slide" presentation will illustrate the nature of the problem and give you some idea of what is involved in seeking a solution.

GENERAL OVERVIEW

1. (Location map) - The study area is located in southeastern British Columbia and northwestern Montana. When John Wesly Powell explored the west, he suggested that political boundaries follow hydrologic units. Dividing a watershed by an international boundary was a good method of demonstrating why Powell, although not listened to, was right.

2. (Study area map) - the Flathead River Basin International Study Board (FRISB) defined an area of study. The mine site is at the confluence of Cabin and Howell Creeks.

3. (Aerial, Flathead Valley in Canada) - the Flathead Valley in Canada just north of the international boundary appears just like many other similar valleys in the region.

4. (North Fork Flathead River) - The North Fork of the Flathead River is the western boundary of Glacier National Park; the

actual boundary being the center of the river.

5. (Glacier Peak) - Glacier National Park, created in 1910, has long been one of our national treasures. Our national parks were created in part to preserve for posterity some of the choicest pieces of American real estate.

6. (Logging in Canada) in the Canadian portion of the Basin, resource development and utilization is a fundamental part of the regional economy. While this photo shows logging in the Canadian portion of the Basin, the area is also subject to extensive seismic exploration and drilling.

THE PERSPECTIVE OF THE MINE

7. (Project plan) Sage Creek Coal Ltd.'s mine site plan showing; the pits in yellow, the waste dumps in pink, the refuse dump uncolored, the settling ponds in blue. In addition, the plant site is shown cross-hatched and the tailings pond is shown with wavy lines.

8. (Proposed mine site) This view of the proposed mine site shows; South Hill, Cabin Creek Valley, North Hill, and the Howell Creek Valley with the Flathead River in the foreground.

9. (South Hill - North Hill) Cabin Creek joins Howell Creek just downstream of the bridge in this photo. The plant site and tailings pond are sited on the far side of Cabin Creek. A settling pond is proposed for the center of this photo. Major dumps will be developed on the right and left side of the photo.

10. (Site map) This map reviews the locations of primary features of the mine. The relative locations of the pits, dumps, ponds and facility features can be seen. The main bull trout spawning area is in Howell Creek near the word "Howell" on the map.

11. (Valley scene) This photo illustrates the type of terrain that one of the dumps and ponds will be built on.

12. (Confluence- Howell Crk. & Flathead River) A large settling pond would be located on the far side of Howell Creek on the right-hand side of this photo.

13. (Coal distribution map) Known coal outcrops occur throughout southeastern British Columbia. They are being mined in the Elk and Fording River Valleys. The Elk\Fording Valleys are just over the ridge from the Flathead Valley. Geologic similarity, geographic proximity, and similarity in mining methods were the reasons the Board chose to use the operating Elk\Fording mines as analogues of the proposed Cabin Creek Mine.

ELK - FORDING VALLEY MINES

14. (Fording coal) Waste dumps, plant site, and part of the Greenhills pit are shown in this photo. This mine is regarded as the most similar in certain features to the proposed Cabin Creek Mine. Careful examination, however, has revealed significant differences.

15. (Line Creek pit) The developing pit is shown in this photo of the Line Creek Mine. Non coal-bearing rock is blasted and rubble is excavated by shovel and truck and dumped on a waste dump. Coal is not blasted, but dug, loaded onto smaller trucks, and hauled to the processing plant.

16. (Haul truck) The unprocessed coal is trucked from the pit to the processing plant over paved roads. Processed coal will be trucked from the proposed Cabin Creek Mine to a railway load-out facility at Morrissey in 59 Tonne trucks. This haul will cover 66 km over an upgraded paved road.

17. (Westar-Harmer Ridge, tailings pond) The Cabin Creek Mine will use a similar wet pond for its tailings. Some successful reclamation can be seen on part of the pond, located in the Elk River Valley.

18. (Waste dump at Line Creek) This dump is approximately 300 meters high from toe to crest. It is about three times as high as those proposed for Cabin Creek. The pictured dumped has failed once as a result of over extending one wrap. The failure was not considered important because the entire valley will eventually be filled.

19. (Flow control structure) This flow control structure on the Line Creek Mine passes water to a series of settling ponds where sediment settles and from which water seeps into the ground. They are the ponds that failed in 1986. The Cabin Creek Mine will not use structures of similar design.

20. (Settling pond) This settling pond beside the Elk River is controlled through seepage into ground water and a decant structure that discharges during higher flows.

21. (Coarse refuse) Refuse from the Westar-Harmer Ridge Mine is laid out in contour fashion on the hillside above the Elk River. Revegetation has begun as part of a reclamation program. A ditch at the base of the slope is designed to prevent runoff from reaching the Elk River.

22. (Harvey Creek) Part of the 66 km paved haul road will follow this valley up Harvey Creek. The road is currently an unpaved logging road and an access road to the Shell exploration camp in the Flathead Valley near Howell Creek.

23. (Line Creek Plant) The narrow, V-shaped valley at the right

center of the photo is Line Creek. The haul road also passes through this gap in the mountains, the backside of which are being mined.

THE PRESERVATION AGENDA

24. (Backpackers) To the people of British Columbia who might be aware of the Flathead River, it is a tiny, isolate drainage tucked away in the extreme southeast corner of the Province. A drainage whose character is not much different than many other Provincial drainages.

25. (Glacier National Park) There are few U.S. citizens who have not heard of Glacier National Park, the crown jewel of the National Park System and, in some way, the symbol of America's conservation agenda.

26. (River scene) Perhaps the essence of this issue is that to one group of people the Flathead is one of many drainages lying in the vast expanse of the Northern Rockies, with many resources having development potential.

27.(River scene) At the same time, to another group the river represents one of the last remnants of what the U.S. was when it was new. These people have made the river a relic of their pristine past and a symbol for a more sensitive future.

28. (Map of the drainage) the Flathead System is a headwater drainage of the Columbia River. Most of the Flathead drainage lies above Flathead Lake. The lake is a major recreation and amenity asset. Our evaluation was focused on issues upstream from Flathead Lake.

Discharges at various locations are:

From the lake - 331 cubic meters\second

Flathead River into the lake - 275 cm\s

North Fork at Columbia Falls - 84 cm\s

North Fork at the boundary - 26.6 Cm\s

6% of the drainage lies north of the boundary

Cabin and Howell Creeks discharge less the 5 cubic meters per second into the system; about 1.3% of the flow.

29. (North Fork road) Impacts of the proposed mine lying at the head of this drainage have been a U.S. concern for a number of years.

30. (Flower) The Province of British Columbia has been generous in allowing the U.S. and Montana concerns to be expressed over the years. This reference is viewed as a continuation of that generosity.

31. (Border) The reference to study this issue must come from both governments. Once it is agreed to, it goes to the International Joint Commission (IJC). The IJC draws its authority from the Boundary Waters Treaty of 1909. The Commission in turn appointed the Flathead River Investigative Board (FRISB). This Board in turn convened a number of technical committees to review numerous aspects of the project and its potential impacts.

32. (Glacier National Park) The U.S. has done about everything its law allows to extend a protective mantle over this area. Glacier National Park was created shortly after the turn of the century - 1910. The North Fork of the Flathead is its western boundary.

33. (Forest) At about that same time, the U.S. was designating forest reserves; many of them to protect national parks. Today, most of the Flathead headwaters flow from national forest lands. One exception to the strict preservation sequence was the construction of Hungry Horse Dam.

34. (River scene) In 1964, the U.S. passed a Wilderness Act and the South Fork headwaters became part of the Bob Marshall Wilderness. The Middle Fork headwaters are part of the Great Bear Wilderness, added to the system in the 1970's. Portions of the North Fork's watershed are current wilderness candidate areas.

35. (Raft in the river) Wilderness classification is the highest magnitude of preservation that can be bestowed. The year the Act was passed was also the year of big floods in this country. Several major dam proposals surfaced in the aftermath, however, all were defeated. Preservation was the prevailing preference.

36 (River scene) The 1970's saw the U.S. Congress pass the Wild and Scenic Rivers Act. All forks of the Flathead were included in the new river protection system.

38. (Wolf) Three species that occupy this area are listed under the Endangered Species Act. This species is the wolf.

39. (Eagle) The bald eagle.

40. (Grizzly) The grizzly bear. The Endangered Species Act constrains what can be done to the habitat of these listed species.

41. (Stream) The preceding steps are major federal actions. The

State of Montana has, likewise, moved to protect streams and associated resources. In 1963, the first stream preservation in the nation became law in Montana. It was designed to prevent the physical alterations of stream channels. In 1969, Montana became the first western state to grant water rights for fish and recreation in 12 of its most valued rivers. All forks of the Flathead were included.

42. (Raft) In 1975, the protection against physical channel alteration was strengthened. In 1983, the state legislature authorized its first river basin commission, the Flathead River Basin Commission, to protect the quality of that area.

43. (River scene) There are also other designations and considerations that should be recognized. These include:

- federal reserved water rights that attach to park designation, wild and scenic rivers classification, and U.S. Forest lands.
- The classification of Glacier and Waterton National Parks as international biospheric reserve sites.
- The nomination of the above-mentioned parks for inclusion in the World Heritage Site Program.

44. (Fisherman) Everything the U.S. law allows has been applied to the headwaters of the Flathead River system for its protection. This reference is an extension of that preservation effort. In the U.S., attempts to preserve a remnant of its pristine condition for cultural, scientific, and recreational purposes, this area represents the best that is left to work with.

45. (Elk) Today the preservation process seems to be working and compatible with the wild and human residents of this somewhat isolated place.

46. (Polebridge) Most human residents who live yearlong in the North Fork drainage live in the community of Polebridge. The town's relatively primitive conditions is the product of local planning and initiative.

47. (Community hall) The community hall, about 6 miles up the road, is a common gathering place. It features aerobic classes for those who feel the need to keep up with the trendy stuff.

48. (Bull trout) Most activity up the North Fork is seasonal. One part-time occupant of significant importance is the bull trout; a fish that lives out a complicated life cycle in this drainage. In the course of events, this life cycle involves crossing the international border and depending on streams that drain into the mine site.

49. (Cutthroat trout) Both the bull trout and the cutthroat have similar life history patterns in this pure yet demanding environment.

50. (Graphic life history diagram) This chart outlines the various stages in the life history of the bull trout and the cutthroat trout.

51. (Gravel and Redd) The first step in the real world of the stream is finding a suitable spawning site. Bull trout concentrate in areas of the stream where groundwater upwellings supply spawning sites with suitable flow.

52. (Young bull trout) The young fish, once hatched, find suitable rearing habitat where they remain before migrating downstream to Flathead Lake. These young fish sometimes remain in the rearing areas for several years.

53. (Flathead Lake) Once in the lake environment, the fish grow to maturity and trophy proportions. The process, complicated as it is, then begins again.

54. These fish, as important as they are, represent only a few of the life forms linked to this river and its total ecology. Their complicated way of doing things has been dictated by their own evolution. To make it work, all components of a complex system must be kept in a workable condition. In all this complexity lies our challenge. It is up to us to insure that what has worked for these and other species can be sustained as human demands are pursued in the North Fork of the Flathead drainage.

CONCLUDING COMMENTS

The Flathead River International Study Board has been working on a technical assessment of the Cabin Creek Coal Mine since the problem was referred for study in April of 1985. This evaluation is nearing completion. When the Board report is printed, it will be distributed and a 90-day review process begun. Following this review, public hearings will be held in both the U.S. and Canada. Following these hearings, the International Joint Commission will seek appropriate solution.

AUDIENCE QUESTIONS & ANSWERS

Roundtable Discussion

Steve Fisher: Mr. Posewitz, do you expect the mine to proceed?

Jim Posewitz: There is no current evidence that the mine is economically viable. That is the good news. The bad news is that we need to find a mechanism that will give us some security to end the threat. The 90-day review period is very important for everyone to come up with a solution. We do not have a key for ending this threat. There is no evidence that any development is imminent. We have the luxury of time to fashion some sort of solution that will give us some security because there is no question that the mine will have an impact on our values.

Steve Fisher: We all know that Canadians have a different view of economics than we do and they have a different way of doing things than we do. Do you see that having any affect?

Jim Posewitz: Their biggest problem right now is to sustain the help at their existing mines. I derive a certain amount of comfort knowing that that exists for now, which does not diminish the need to find a long-term solution.

Dick Wollin: Mr. Gaffney, your presentation was a very intriguing one. Would you make copies of that available?

Frank Gaffney: I understand that they are being printed in the Conference Record.

Dick Wollin: Would you comment on your center, your staff, and your funding and how you operate?

Frank Gaffney: Yes. We are a non-profit organization, located in downtown Seattle. Our funding comes from a variety of sources. The Timber/Fish/Wildlife negotiations themselves were funded entirely by the participants. 70% was funded by the state of Washington, about 30% by the Forest Products Industry, with some in-kind support provided by the Tribes and the environmental community. We also have received grants for some other projects from rather substantial national foundations that give either to economic development projects or to natural resource-type projects. We have been funded in the past by one of the sponsors of this symposium, The Northwest Area Foundation, in Minneapolis/St. Paul.

With any non-profit organization, especially in a new, growing field, it is always a real struggle to fund the organization. We are small, consisting entirely of seven people. Our projects themselves carry 50% of the overhead burden of the organization.

Jon Heberling: Mr. Posewitz, as I recall Howell Creek was once an important bull trout spawning area. I understand that upstream logging has damaged the fishery and I am wondering if this is still a viable fishery?

Jim Posewitz: The answer is yes, it is still viable. We consider it to support about 10% of the full Flathead Lake spawning potential, about 55% of the fish that cross the border use Cabin and Howell Creeks. For purposes of our report and what our committees have been reporting to us, it is still viable as a spawning stream.

Max Dodson: Ken Lustig, do you feel there is a role for the federal government in groundwater protection?

Ken Lustig: Yes, I think technology transfer is another role for the federal government, specifically in groundwater issues. Groundwater, unlike surface water, moves so slowly that in most cases it is ultimately going to have to be managed at a local level with local solutions tailored to different communities and their demands.

Frank Gaffney: I would also like to add that if you want more information on the Timber/Fish/Wildlife process there are a number of tabloids in the back of the room that describe the agreement and how we reached it. I sent enough to the staff here so that you all should be able to take a couple home.

Max Dodson: Don Peterson, you mentioned your phosphorus budget for Summit County indicating that one of the major categories is in the area of nonpoint sources. What do you think is possible, for local government, in control of nonpoint sources? As you know, most state and federal organizations do not have that regulatory ability to control that sort of problem.

Don Peterson: When you sit down and create a budget leave room to do some nonpoint source testing of small projects. Fund it and see what you get out of it.

There are two projects that happened to Summit County. One was done by the Northwest Council of Governments at a site just before entering the Dillon, to see if the literature was accurate about the amount of phosphorus you might remove. This is a small test. It showed the propoerly designed and removed about 45% in the initial stages and the perculation pit behind it took it up to 68% of phosphorus removal. Fairly inexpensive compared to tertiary treatment or even the operation of tertiary treatment after it is in place. If you get into these kinds of things, see what you can do. I would budget for it, I don't know that you would get the Legislature to do that for you. I still come back to the idea that you have to help yourself.

Elna Darrow: Jim Posewitz, will there be a role for the recent economic study in the IJC?

Jim Posewitz: We have already done an economic analysis of the direct loss of the bulltrout. We acknowledge that there is a larger, more intrinsic value, but we don't try to quantify that because of disagreements over methodology. The new figures will not be in the report but our old figures will be.

Unknown Questioner: Mr. Gaffney, when you have parties that have different interests and different organizational operating rules, what is your objective in trying to get these people to work together?

Frank Gaffney: The consensus process itself lends itself to things like that because there are no votes. When you go into a negotiating session, such as this, you may be sitting across the table from an agency director, but he is your equal at the table. It cuts across all of those lines because you all have to agree before you are going to walk out of that room.

The one thing that I didn't talk about much is as the negotiations progress, and we reached agreement on some of the little parts that were going to make-up the final package, each of the parties begin to own a little section of that agreement. And they knew that if they didn't strive to reach the final agreement, they lost all of the gains they had reached already. In a sense, the process gets some of its own self momentum. By going through an effort like this each of the negotiators has to, by necessity, adopt the legitimate goals of the others at the table. I say to all of you in the natural resource business, we are all in it together and there is no way to get out.

Steve Fisher: Mr. Posewitz, are there any citizen groups or conservation groups on the other side of the Canadian border that are in opposition to the coal mine?

Jim Posewitz: There were some that testified in opposition at other hearings. It is just a difficult, political system in which to have effective opposition. It will not be decided on the basis of levels of citizen advocacy that can be generated in Canada. There are some, but the groups are small and relatively ineffective. The solution will be the U.S. government.

Steve Fisher: This panel is interesting. We have three problems that have been solved and one that needs to be solved. I would like to hear Mr. Peterson, Mr. Gaffney, and also Mr. Lustig address the perceived problem of a coal mine.

Don Peterson: The real key to an issue like that which has so many different compounds is to use a neutral party. All of those interested, sit down and talk about it. Of course, you must include your northern neighbor and what their industries and ministries are thinking, and what their needs are. If you put everyone in a room and sit down and hammer out these issues, you are going to come out with some solutions. One of the problems is, obviously, is making the citizen understand what that group is doing. Did they sell us down the river? You get back to the marketing ideas that once you arrive at that consensus point, and you make certain decisions to help each other, you have to sell it. You can't let it get out of hand or you wind up being sued.

Ken Lustig: We are, as a society, to a point where we are stopping and looking at the environment not just as a commodity anymore. That is imperative, a matter of perspective. Values and beliefs are fundamental to what we do not only as individuals but as a nation. This is obviously a case that has to be negotiated. I would like to see it step out of the economic ring. There needs to be something protected simply because it is the right thing to do. I don't think it goes much further than that.

Ed Brannon: Mr. Gaffney, it appears from what you did that success was due to a number of things, but particularly trained, skilled negotiators seems to be critical. I would like your comment on that. Also, having all of the players around the table it seems that it's the group that isn't there that is the problem. How did you deal with that?

Frank Gaffney: We spent a good deal of time before the process actually began talking with people about who had to be included if we were to reach a final agreement. We reached out to all of them. We were successful in convincing them that it was worth the shot to go through that first long weekend and try to figure out if this process was real.

It is absolutely important that you try to find a neutral third party to provide a catalyst to keep this going. The center was successful in convincing the negotiators and believe me it's their agreement, not ours, they arrived there. We were committed to the process only. We gave them some groundrules; we gave them a deadline that they agreed to; and we were ruthless in keeping their feet to the fire to meet those deadlines and to stay within those groundrules. They themselves came up with the answer.

When it first started back in the mid-1970's, many people felt that the mediators could come with their own technical resources to try and assist the people through these difficult questions. The first thing that happened was that the mediator showed up with an answer and half of the people in the room felt that it was turned against them and they threw him out. As this process has evolved, people now know that technical expertise exists within the warring factions to come up with the answer, if the mediation team is successful in creating an atmosphere to unlock the creativity and flexibility that is already there. Again, I will say that there are not many people doing the work that we do but I think it is absolutely critical if you are trying to solve a problem like this that you do identify a neutral third party to keep your feet to the fire and keep the process moving.

Hugh Zackheim: Jim Posewitz, in relation to Cabin Creek we are not in a great negotiating position. I assume the value of the coal, however, can be determined. Has there been any precedented, in terms of IJC actions, relations to resource trading?

Jim Posewitz: Yes. In the case of Ross Dam, near Seattle, there were tradeoffs in reference to the dam height. We must find something of value in B.C. to tradeoff in exchange for our values.

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ADDRESS TO FLATHEAD BASIN COMMISSION
BY
SENATOR MAX BAUCUS

APRIL 26, 1988

Good morning. I understand I'm actually coming to you larger than life today.

I want to thank Brace Hayden for the invitation to speak to you. I only wish I could be there in person to soak up a little Montana spring on the shores of Flathead Lake.

As I was preparing for today's talk, I spent time reviewing what brings us together for this symposium. It was 10 years ago that we succeeded in our effort to get funds from EPA for the Flathead River Basin Environmental Impact Study.

As many of you remember, that was an uphill battle, and it took a lot of arm twisting in Washington to keep the money coming. But we succeeded.

As a result, during the past decade researchers have been able to gather the data that are needed to assess the health of the Flathead River Basin and Flathead Lake. That data now can be used to make wise decisions for the future management of this very significant water resource.

Earlier in this conference you heard from the key scientists who have been quantifying, investigating, and trying to understand the natural resource known as the Flathead River Basin.

On both a national and international level, the Flathead Basin is truly a unique resource. Its splendor is unmatched.

Flathead Lake is pure. Few bodies of water in the world match it for pristine quality.

You know, in Washington I don't live far from the Potomac River. I do a lot of running in a park next to the river. There was a time, not too long ago, when the Potomac was one of the filthiest streams in this country. It's better now. But a warm summer run can still be an aromatic experience.

When I compare those runs along the smelly Potomac to a brisk swim in Flathead Lake, I know our responsibilty is clear.

We must continue to protect this precious Montana resource.

It's only been through the conscious efforts and diligent planning of people like you that Flathead Lake is as clean and pure as it is today.

When we look at Flathead Lake, its good health is nothing short of phenomenal. The lake is located downstream from a major agricultural area. It's within an area extensively managed for timber production. And it's the home of one of the most important aluminum producers in the world.

But the lake is only part of the resource we need to protect. Picture in your mind for a minute what makes up this basin.

First, of course, is the lake.

Next, there's the three forks of the Flathead River, along with the Swan, the Whitefish, and the Stillwater Rivers. Each contributes to making the basin what it is.

Finally, reach out a little further and we pull in the gems of the Northern Rockies: Glacier National Park, the Bob Marshall Wilderness, and the Mission Mountains.

This is the whole of the Flathead Basin. Its magnificence and beauty are awe inspiring. In the moments when we are quiet, and we open ourselves to the splendor that surrounds us, we can genuinely feel in our souls the gift we've been given.

But at the same time, being the humans that we are, we can become complacent about all that we have. If we allow a little slippage here, or a little degradation there, this treasure will soon be lost.

Fortunately that isn't happening. The people who live here are not letting it happen. YOU CARE! That shows in the effort you've put into protecting the basin. It shows by your presence here today.

And, most importantly, it shows by what you have. The old saying, "The proof is in the pudding," couldn't be more true.

The proof is right here for you to see and enjoy. The fruits of your labor are abundant. You should be very proud of what you've done.

I know I'm proud of what I've been able to do with you to protect the Flathead area.

Together we got the three forks of the Flathead River included in the Wild, Scenic, and Recreational River System.

As I mentioned earlier, when the Cabin Creek coal mine was proposed in British Columbia, we succeeded in getting EPA to conduct the Flathead River study.

That effort will pay off later this spring when the International Joint Commission issues its report on the impact of the proposed mine.

The study also showed the vulnerability of Flathead Lake to phosphorous pollution. The finding spurred Flathead citizens to take their case to the legislature, and phosphate-based detergents are now banned in the basin.

On another front, we then realized the risk of contamination to the basin's air quality, the Salish and Kootenai tribes took action and had the southern portion of the basin reclassified as a Class One airshed.

While the tribes had the legal authority to take this step on their own, they didn't operate in a vacuum. They were joined by the Flathead County Commissioners and the major industry in the basin, the Columbia Falls aluminum plant.

The Flathead Basin study lasted 5 years. When it was drawing to a close, the people of the Flathead Valley saw the need to continue the project; to make it an institution.

Through the efforts of Jean Turnage, a State senator at the time, and Governor Schwinden, the Flathead Basin Commission was established. In fact, it was 5 years ago this month that Ted brought the bill authorizing the commission to the edge of the lake and signed it in a special ceremony at Yellow Bay.

Today's meeting is a tribute to the success of the commission. It's vitality is an excellent example of what can happen when neighbors work together toward a common goal.

But what's down the road? You and the commission will continue facing tough challenges. Because the Flathead Basin is a living, dynamic entity, it will change; the world around it will change. Events we can't even imagine today will loom as threats to the Flathead in the future.

Your work will never be easy. The temptation is always present to sacrifice a little quality today, thinking it won't make much difference in the long run.

But we know that's not true. As a nation, we're facing many serious environmental problems because of that type of neglect in the past.

For example, we have learned much about the environmental damage that was done when we just tossed our hazardous wastes in a pile behind the factory, or dumped them in the river next door. That's why we have Superfund today.

Now we're learning how much damage can result from the improper disposal of municipal waste. Surface and ground water are being polluted and toxic substances are being emitted into the air.

Our nation has become paralyzed in its efforts to address the problems of acid rain. Fortunately the Flathead Valley hasn't yet fallen vitim to acid rain, but we are seeing its effect not too many miles away in the Bitterroots.

Toxic contaminants are routinely being picked up in fish from the Great Lakes. A recent survey in that area found a toxic residue that's present in a pesticide that's only used on rice crops. Rice doesn't grow around the Great Lakes. So where did the contaminant come from?

Experts tell us the Chesapeake Bay is dying. They say nutrient overload is the problem. As we learn more about the nutrient problem, we find that toxic chemicals may also be contributing to the bay's demise.

I do not want to sound like a doomsayer. But I do want to leave you with a sense that as a nation, we still have a long way to go to protect our environmental health.

In deciding how to attain this goal, the question of environmental priorities comes up time and time again. It even has a name. EPA calls it risk assessment and risk management.

If you think that sounds like bureaucratese--you're right. And in reality, it's just an excuse for degradation, not protection.

Risk assessment is a mathematical process used to address the threats posed by substances which have long latency period before they cause disease and death.

Hidden within the bowels of "risk assessment" is a procedure for considering the population at risk. The bureaucrats reason that the more people exposed, the greater the risk; or, on the other side of the coin, the fewer people exposed, the less risk.

Taken to its extreme, risk assessment translates into "urban population--high risk" and "rural population--low risk."

The assessment methodology doesn't need to be used in this fashion. But under the guise of being a science, it happens easily.

You and I know this approach is wrong. And it's especially wrong for an area like the Flathead. This area has not maintained the quality we enjoy today because we accepted the risk of a little degradation here and little there under some sort of "assessment methodology."

No. The Flathead is the way it is today because people said we don't want to see its quality slip--not even to the smallest degree.

Cabin Creek Coal was the threat of yesterday.

The threats of tomorrow will be more subtle. They will most likely come from outside the basin. They will be in the form of both contaminants from toxic sources and policy from government.

I urge you to be diligent and knowledgeable on both fronts. Arm yourselves to battle both chemicals and bureaucrats.

The Flathead is the way it is today because of you--the people who care. You have every right to be proud of what you've accomplished. I'm pleased to have worked with you.

We have fought off the threats in the past. I want you to know I continue to be with you as we fend off the threats of tomorrow.

Thank you again for giving me this time to share my thoughts with you. Congratulations on your accomplishments. Keep up the good work.

Clean Water and the Regional Economy

Dan Black, Daily Inter Lake

When Craig and Brace asked to meet with me 6 months ago to talk about a clean water conference, I said, "Sure," presuming they wanted something simple, like publicity.

When they asked me to talk about clean water and the regional economy, I laughed at the absurdity of it.

But this day was 6 months off back then, and when they persisted, I agreed, since I had nothing else scheduled this far in advance, and since they made refusing sound about as unneighborly as dumping sewage in down a well.

You cannot imagine how many times since I have reminded myself what a fool I was. Or how many more times I have asked myself what fascinating things a newspaper reporter could tell you about clean water and the economy?

Nothing learn-ed, I'm afraid.

What I know about water comes from personal experience over roughly 45 years as a consumer. In that period of time I've taken more than 10,000 baths, and showers; drunk more than 20,000 cups of coffee; flushed at least that many times; washed enough dishes to serve an army; done countless loads of laundry, poured thousands of gallons of water on tomato plants, raspberries, apple trees and other delicacies we grow for the deer.

I can identify the worst tasting water I've ever drunk, which was on the Pacific Coast in Olympic National Park, followed closely by the municipal water system in Ryegate, Montana — and the best, which is from my 725-foot well at my home near Kila. And I find it amusing that that well taps an aquifer nearly 300 feet below the swampy pond knows as Smith Lake, which is just down the hill from me.

I can tell you, having paid for a portion of that $20,000 well, that Ben Franklin was wrong when he said, "You never know the worth of water till the well runs dry."

At the same time, having hauled water in cream cans as a child and having spent a summer hearing only distant gurgling when we turned on the tap, I can fully appreciate the luxury of actually getting hot water when you step into the shower.

Based on that admittedly limited experience, I can also tell you unequivocally that I prefer clean water to dirty water, but that any water is better than no water at all.

Which I suppose is something like heresy at a gathering of this sort, but it's a view shared by many out there in the world from whence cometh our funding.

Nevertheless, I, like most of my neighbors, cherish our pure lakes and streams — clean open water that in most parts of northwest Montana, we would happily drink from if we were thirsty.

Does it have an economic value?

I suppose it does, although to be honest, I'd be hard-pressed to tell you what it is. And I'd be very skeptical of any dollar value anyone else attempted to place on it.

For instance, how clean does water have to be for folks to fish it or sail it or live next to it? We have "world class water," according to what I read in the newspaper -- "as clean as any system in the world."

How does that fact affect real estate priced along Flathead Lake? Most observers would concur that while the lake is still remarkably pure, it is less pristine than it was 50 years ago or 20 years ago. Yet the price of a lakefront home continues to soar. I have yet to hear of a sale that has depended on the results of a Flathead Lake water sample.

Neither do fishermen troll Flathead Lake or Ashley Lake or any of the others in the system in quest of pure water samples. They want fish. Preferably big ones, and frequent ones.

And having watched the dedication of friends who have been gracious enough to invite me sailing with them, I wonder at what stage in the eutrophication process would they pull their boats from Flathead Lake.

How about tourism?

No doubt seeing scum on Flathead Lake would be a turnoff to visitors who appreciate its pristine qualities. But would they stop coming here? Would they instead take their skiis to Aspen, in the winter or their tents to Yosemite in the summer?

Neither you nor I nor anyone else would like to find out. But the point is, can anyone say with any degree of authority what value pristine water, as opposed to just water, has to our tourist industry?

In fact, if you take a cold, unemotional look around the Flathead for industries that depend on a system of pristine lakes and rivers and streams, you're hard pressed to find one.

Not timber, which together with its related enterprises employs more workers at higher wages than anything else, adding to the tax base as it adds to the water quality problem.

Not the aluminum plant, whose future is tied not to clean water but to cheap electrical power and the world metals market.

Not agriculture, which requires sizeable amounts of compounds that are apt to leach into the groundwater and add to the problem.

Futhermore, I think those of us who cherish our "world class system" should not rely on a dollars-and-cents argument to persuade others. We may lose.

Clean water is expensive. Loggers who'd like to log next to mountain streams, who have to construct ways over or around those creeks, know how much it costs.

So do manufacturing plants who spend millions to clean or recycle the water or scrub pollutants from their smokestacks.

So do the people who are told they'll have to build a waste-water treatment system to replace their septic tanks, or who must pay higher monthly sewer bills to protect Flathead Lake.

It would would be convenient, perhaps, to be able to show that preserving the basin's purity has immediate economic benefits. But that argument, I think, is unconvincing.

I support the effort to protect the integrity of the Flathead Basin for one basic reason that I think holds true for a lot of people: That is, I do not wish to live in a sewer.

Most of the growth in the Flathead Basin in the last decade and a half has been from in-migration. Despite impressive growth in employment here, the unemployment rate has been consistently higher than the state or national average, and that fact has been well publicized.

We have to assume, then, that the people moving here are motivated by something other than economic opportunity -- most likely the natural qualities of the region, excluding the winter sunshine.

If that's what brought them here, isn't it fair to assume also that given a reasonable plan, they'll do what it takes to preserve the integrity of the basin?

I see a corollary of sorts in the predicament of the tiny rural community water system I am a part of. We have a very expensive and not very productive well. Our little system supplies nine families with water. Barely.

Some of us would like to pour more of it on lawns and gardens in the heat of the summer in the forlorn hope that we might get a tomato off the vine before the frost or the deer get it.

Not everybody wants more water badly enough to pay to find more. Some people think it doesn't make good sense to spend a lot of money just so we can put more or it on lawns or tomatoes.

We'd be better off with half as many families using the system, but then it would cost everyone twice as much.

And so we get along with what we have with people reasonably cheerful about balancing what we'd like to have with what we're able to pay for.

We face much the same dilemma within the basin.

Any growth in our economy puts additional pressure on the integrity of the water system. At the same time, restraints on economic growth would make it difficult to pay for what we have.

Most of us are unwilling to accept anything less than what we have right now, either in the region's economy or in the quality of life we enjoy, that hard-to-measure factor that clean water is so much a part of.

I don't think we can deny that there's a very real cost to clean water, a cost we have to bear within the region. Balancing that cost with the ability to pay will take not only a healthy respect for what we have, but a healthy economy as well.

AGRICULTURE: PAST, PRESENT AND FUTURE
IN THE FLATHEAD VALLEY PERSPECTIVE

FOR PRESENTATION TO THE FLATHEAD BASIN COMISSION
PREPARED BY
KEITH KELLY, DIRECTOR
MONTANA DEPARTMENT OF AGRICULTURE
APRIL 25, 1988

Agriculture has been an important part of the Flathead Valley economy since the late 1880's. Early Montana settlers came to the valley and began agriculture and timber operations. The agricultural base in the area grew along with the influx of railroads into the area, providing transportation for the goods that were produced in the valley. As people moved to the valley, roads were constructed, lumber mills were built, and the rich soils tilled.

The population in Flathead Valley has continued to grow over the years, and the use of the land in the area has gradually changed. There is no doubt that the growth of population puts pressure on the land and its resources.

As the number of people in the valley grows, land previously used for agriculture is being used in new ways. Agricultural land in the Flathead Valley has been affected by the influx of people and is being broken down into smaller and smaller plots. During the period of 1973 to 1980, 44,431 acres in the county were divided into 1,609 parcels that were larger than 20 acres. Much of this land was once a part of a larger agricultural unit. This land and other subdivided sections exhibit developing urban characteristics. The size of the subdivided properties has the most effect on agriculture in the valley. While any residential development on previously agricultural land has the potential to develop conflicts, in many cases acreages in the very small to intermediate size more often result in at least some or most of the land being neglected or mismanaged.

One area of deep concern to the Department of Agriculture is the issue of weed control. Weeds may develop into a problem on some of the smaller parcels. With the invasion of noxious weeds, and the continuing war against these weeds, we need the cooperation of all landowners. These weeds can overtake a small parcel of land and ruin much of its grazing value. If ignored, the problem will spread to other areas and the cost of fighting the damage these weeds cause will be astronomical.

Cropland has become pastureland for grazing use. The evolution of the 20th century ranchette has brought many one-time urban dwellers to seek their 20 acres in the country. The conversion continues. What used to grow trees became cropland. The cropland is now becoming residential areas.

The trend towards the smaller farms in the area is unlike the national trend. Nationally, farms are growing larger as farmers try to take advantage of the economies of scale in larger operations. Producers in the Flathead Valley seem to have overcome these economies in many examples. The size of their plots and the intensive agriculture evidenced in these plots have brought about a new type of agriculture, seen in only few places in the nation.

Cropland irrigation has always been a factor since there has always been an abundance of water in the valley. The amount of irrigation in the area hit an all time high in 1978, and has since decreased. The reasons for the decrease in irrigation seem to be a combination of two things. First, the price of equipment for irrigation has increased dramatically, and secondly, the size of the plots that need irrigation has decreased.

Water levels in the area have been at a decreased level for several years. This has been a major concern of people in the Flathead Valley. Not only does this affect the urban areas, but also seriously impacts the productivity of the agricultural producers. The amount of precipitation has been rather cyclical in the past, and will hopefully continue the cycle on to more moisture in the coming years.

The trend towards smaller agricultural operations is seen as a continuing one. As population in the area grows, there will continue to be smaller farms with income being supplemented by work off of the farm. Since the agricultural production will be a secondary income to the families on these farms, productivity and marketing will be a big factor in their success.

One of the biggest trends in agriculture in the area has been towards sustainable agriculture. Some innovative Montana producers have seen this as the future for Montana's competitiveness in the national and international market. They are involving themselves in first, an agriculture that is less dependent on expensive, non-labor commercial inputs. Secondly, they are consciously enhancing the natural resource base on which they depend. And third, their farms are diversified and adaptive.

Producing products using sustainable agriculture is not only a healthful way to raise agricultural products, but also is better for the environment. By reducing chemical and artificial inputs in production, there will be a lesser chance of harming the environment. Some producers, using crop insect scouts, and other preventative means of pest control, have found a marked decrease in the amount of chemical control. Several producers in the Flathead Valley are presently using these methods, and others are joining the growing trend.

Reduction in the use of chemical and artificial inputs in agriculture has been precipitated by the rising costs of such inputs. In the early 1980's, with high interest rates and poor growing conditions, producers had to find alternatives to the costly inputs. By using alternative cultivation methods and biological control, farmers have been able to reduce input costs.

Another area of agriculture that has received much attention lately and has grown dramatically, is the area of alternative crops. No longer are Montana's producers content to grow the traditional crops and rely on government subsidies to support them. Some of these Montana farmers and ranchers are beginning to challenge conventional wisdom. Long vulnerable to price shifts and changing interest rates, producers are joining together to share information, resources, and markets. Though there may be some risk in the short term, in the long term, Montana producers cannot afford to ignore alternatives.

The Marketing Program in the Department of Agriculture is actively involved in development of alternative crops in Montana. We are presently working with the Cooperative Extension Service and the Agricultural Experiment Stations to gather research that has already been completed in Montana for alternative crops. A survey is also being prepared that will be going out to several hundred agricultural producers to determine what crops are presently being grown in Montana. When this information is compiled it will be made available to the public.

We are also involved in formation of a State Hay Quality Association, and a Specialty Crops Association (Great Northern Botanicals Association). This summer the department will have a full-time student intern whose duties will be alternative crops research.

The department is also very involved in developing new markets for existing crops by specializing the crop or identification of specialized markets. An example of this is organic wheat flour that is processed in Montana and sold in State and to specialty bakers in California.

Montana has long been known for its entrepreneurial spirit. Farmers and ranchers have sought out new markets for previously "traditional" crops. By vertically integrating their products towards the consumer, through new packaging, or using new marketing techniques, many producers have found new markets for their products.

Agriculture in the Flathead Valley is changing and adapting as land use changes. Through the use of technological changes and new marketing ideas, the area is facing the challenges of today's economy and looking forward to tomorrow. Agricultural producers in Flathead Valley are preparing themselves for a productive and profitable future.

Industry That Fits:
The Case For Secondary Wood Manufacturing

CLINT GRIMES

President, Grimes & Associates

From the perspective of my company, what we try to do is look at an industrial area or an economy in terms of how it fits within the global economy. We believe strongly that the term global economy is a reality. And because we do, we look at the timber resource here and try to look at how that fits in the world wood economy. And of course it does fit and there are products which leave the Flathead Basin everyday for world markets. If we are zeroed in on the logging trucks coming down the road with logs on them and someone making 2x4's down the road and so on, we tend to overlook the fact that there are some very sophisticated manufacturers of wood products in this basin right now. The products that they manufacture go all over the world.

I read things in the paper about the wood industry that seem to me to be, in many ways, about two decades behind. Let me give you some examples of what I am talking about. If you look at the industrial history of Montana, one of the things that you will find is we have been a commodities-oriented economy. We take stuff out of the ground (ie. metals) and ship ingots off to other places for manufacturing. The history of the timber industry has been one of turning the timber into dimension lumber and shipping it off wherever it goes. But that's changing and it has changed and I think sometimes, from what I am able to pick-up in the newspapers, I don't think people appreciate the extent to which that has changed nor the rate at which it's changing right now. Our firm, we hope, is involved in accelerating that rate of change. To refer to the change, I use the term "re-manufacturing".

We have all been reading about the decline of the smokestack industries, the deterioration of the so called "rust belt" and all of the jobs that were lost in manufacturing in the United States over the past two decades. Even with the decline of the rust belt, even with the shutting down of large plants in manufacturing in the midwest and in the east, the truth of the matter is that 23 to 24% of the GNP has been manufacturing related through that period. In other words, manufacturing in the United States is not a declining industry. It has maintained between 23 to 24% of the GNP continually throughout all of these cataclysmic changes that have occurred over the past two decades. That's an interesting thing and what is really interesting is what has replaced these large industries. Essentially they are are small, flexible manufacturing companies. They range in size from twenty people up to forty people and they tend to be characterized by entirely different criteria than the former large manufacturing complexes which were the hallmark of American industry for the last five decades. They have fewer people working; they tend to have better technology; they tend to be much more flexible in terms of the products they produce; they are producing more jobs. These smaller companies, than are the large industries in terms of a percentage increase in jobs annually. They tend to be market-driven and by that I mean they are very flexible when there are changes in product markets. They are able to adapt to the product markets. They tend to be service-oriented. They tend to be service-oriented in the sense that they are willing to really look at a customer's needs. They've adopted the philosophy of the Japanese trading companies which is the "customer is king". They have been very, very responsive to whatever the customer wants. Hence, they are providing a service. Part of the service is they are very responsible in terms of delivery times. They tend to be run by people who have no background in manufacturing. They are often in major areas where there is the "New Americans". In other words the Vietnamese, the Chicanos and so on. They tend to employ New Americans who have better work ethics apparently than Older Americans - at least one commentator pointed this out. One of the things that is interesting about this is that this development has also taken place in the wood industry, not to the extent I would like to see it, in Montana, but it has in other places.

There has been a kind of renaissance in manufacturing in the United States and there is coming to be a renaissance in wood manufacturing in the United States. Let me tell you what some of the reasons are because there are some parallels. If you take the furniture industry in the United States as an example, there tend to be some parallels between the furniture industry in the United States and the consumer electronics industry in the United States. The consumer electronics industry, as you will remember, went over-seas, it went off-shore. All of the audio/visual stuff that you and I buy is made in Taiwan, Sri Lanka and God knows where else, by low cost labor. Printed circuit boards are maybe printed here, maybe they are printed in Hong Kong but they are assembled by low cost labor. Almost every analyst of the post-70's manufacturing in the world agrees that if you go off-shore now with your manufacturing and you base that manufacturing on merely cheap labor, you are destined for economic oblivion within a decade. In other words, cheap labor as a solution to your manufacturing problem, your pricing problem, is not a solution anymore. And the reason for that is unless you have the best manufacturing technology available in the world, cheap labor will not solve your problem within the next decade. Peter Drucker, Jim Hawkins, whoever you want will tell you that. Many companies are finding this out and many companies are bringing manufacturing back to U.S. shores. This is true in the garment industry, it's true in the electronics industry and so on.

Now this has some severe implications from the standpoint of life in third world countries where people have been employed in doing this and there may be some very serious dislocations there. It may be that some foreign countries, third world countries, that have done this will invest heavily in more modern manufacturing and technologies and save themselves. That is a possibility. It's unlikely, however, because of the capital costs involved. And it will be unlikely to occur without some severe political dislocations because you are going to replace all of those people that are doing all of those manual labor jobs.

But in the U.S. there is a renaissance going on. Let me give you some statistics. Taiwan is a major furniture manufacturing center for the United States. Taiwan sells back to the United States about 1.1 to 1.5 billion dollars worth of furniture annually. There has been a 58% drop over the past year, however, in those sales back to the United States. The reason for this is that because of the low-value dollar, they are not now competitive in the way they used to be. Their response to this, of course, is to open up some markets in Europe where they are still competitive with the market. Furniture parts shipped back to the U.S. are down from Taiwan. What is happening in furniture is the same thing that is happening in electronics. The furniture industry in the U.S., as well as some of the commercial cabinet industries, are saying "We need to re-invest in plants and begin manufacturing these parts ourselves." And that is going on at a very high rate. Interestingly enough, most of the technology which is going into those plants is technology machinery, process technology that is coming out of Europe. In many cases, coming out of places that we had not thought of before as manufacturers of wood equipment. Italy, for example, Belgium, and to some extent Scandinavia, but to a greater extent West Germany. So we are buying. We are indeed in a global market. We are buying wood manufacturing machinery, very hi-tech machinery often from Europe, placing it in the U.S. to manufacture parts that were previously made in Taiwan because of low labor costs and are now being made back here again. We are shipping that furniture and furniture parts back to Taiwan and in some cases selling furniture in Europe with machinery made in Europe, located here. We are in a global economy.

Let's take a look at the soft-wood timber area of Montana. Like I said, Montana is freighted with a past. I know there are a good many people here who would regard themselves as members of the environmental movement. In all fairness I must say to you that you have had kind of a sitting duck, in Montana. It's very easy to take on the industries of the past in Montana. The timber industry is one of them. That's because it is a commodities industry. There is the so called rape and scrape thing but things have changed in Montana. Environmentalists would like to take credit for it but in part the market takes some credit for it too. As you move from more commodities-type products to more added-value type products, you get better utilization of the raw material.

I also think it is probably not well known right here in the valley but Plum Creek Corporation, for example, manufactures one of the premier grades of medium density fiber boards in the world. It is highly sought after. Alot of it is sold to Taiwan where it is made into furniture and then shipped back here. It is sold in Scandinavia and used there in furniture which is sold throughout Europe and sold back here. I think it is interesting, how a larger company like Plum Creek has managed to find some niche markets in essentially a partially re-manufactured product like MDF and plywood. We have some mills here that are shipping fir and larch to the Netherlands. When I asked them what is being made from the fir and larch in the Netherlands, they can't tell me which I think is an interesting marketing strategy, or lack of it. But it does seem to me that things are changing very rapidly within the area and within the wood industry generally in the Northwest.

We found in the study I did for the Montana International Trade Commission, that product development in Scandinavia is far, far better than product development in the United States, especially in soft woods. You can go to a lumber yard and purchase a soft wood flooring which has been hardened through a technique developed in Scandinavia. It is beautiful parquet flooring which is made out of pine. Gorgeous stuff. We haven't done that here yet, but I think we have a lesson to learn. They have to utilize softwoods because that is all they have. Otherwise they have to import everything from Africa. Denmark has made its name in the world furniture business with importations of hardwoods from Africa. That is a long way from Africa to Denmark but they have done that very successfully. The Swedes and the Fins, which have a softwood forestry, have been marketing in Europe and the United States for years all kinds of softwood products. However, they're in trouble right now because their raw material costs are very much higher than ours. We have some real opportunities in the manufacture of similar marketable products from softwoods in this country because European stumpage costs are incredibly high.

I have passed out to you some samples. The large piece is laminated pine. The pine grew locally and was sawed into strips. Unfortunately there is no laminating facility in Montana, so we had to ship it to Oregon to have it laminated. But the laminated product sells for about eight to nine times what a 2x4 sells for but it was made from 2x4's. A 2x4 sells for about $285.00 per thousand. The laminated product sells for about $800.00 per thousand. There is a world market for that product. In addition, the other pieces that I showed you made of fir and larch sells for about $2500 per thousand. So when I talk to you about added value, I am talking about significant added value.

We have the raw materials. The transportation myth which I grew up with as a Montanan that you can't ship anything out of Montana because it's too far from anywhere, is just that - a myth. It is also part of the commodities mentality. If you ship a carload of grain you are a victim of the rates on the railroad, even when they are low. However, if you ship a carload of pasta made from that grain the difference between the price of the grain and the pasta makes you more competitive in a market a long ways away. In other words, the incremental cost of a carload is much greater. I would much rather send $2500 per thousand wood to Seattle for $600 than I would $285 per thousand 2x4's to Seattle for $600 in a 48000 pound load. I guess you get the drift. Some companies here are doing it now; however, it can be substantially improved. How do you do it? You do good business plans, good marketing plans and then you go somewhere where they have money and try to get them to invest and that's my job.

MAKING SENSE OF DOLLARS AND FISH

BY

PATRICK J. GRAHAM

CHIEF OF THE FISHERIES DIVISION
MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

PRESENTED AT

FLATHEAD BASIN CLEAN WATER SYMPOSIUM

KALISPELL, MONTANA
APRIL 26, 1988

Montana has some of the finest quality fishing opportunities in the country. In part, that quality comes from the diversity of those opportunities, and northwest Montana probably has the most diverse fishing opportunities in the state.

You can search the deep waters for trophy lake trout, cast in the wilderness streams for native cutthroat, stalk largemouth bass in pothole lakes, troll for the tasty kokanee, or pursue any number of fish in almost any natural setting you desire.

As diverse as these fisheries are, so to are the fishermen who pursue them. Some fish for relaxation, others for excitement, still others fish to test their skills, to get away from it all, to be out in nature, for meat or trophies.

Some fishermen travel hundreds of miles to fish for a certain species, during a select season on a favorite water. Others cast into a water scarcely knowing what they might pull out, and possibly not even caring.

How do you place a value on these experiences and what does it mean? These are questions our department has been wrestling with for a number of years. They are also issues many other land and water management agencies have had to face in recent years.

There are several kinds of values for fishing and other forms of recreation, and each is valid for use in different ways.

A common way to determine value is to look at indirect measures. For example, Montana currently sells the third largest number of non-resident fishing licenses of any state in this country. We follow only Michigan and Wisconsin, states surrounded by large population centers and the Great Lakes. Montana continues to attract fishermen from across the country despite our relative remoteness because of the quality of the fishing opportunities.

Another indirect measure is the amount of money spent on mitigating and enhancing fisheries in the Flathead Basin as a result of past hydropower development. The Bonneville Power Administration has invested substantial money over the past seven years in studies and mitigation measures implemented by the Confederated Salish and Kootenai Tribes, our department and the U.S. Fish and Wildlife Service. The Bureau of Reclamation, U. S. Forest Service, Montana Power Co. and others also contributed financially to efforts which have benefited both native and non-native sport fishes.

Another measure of value is the dollars spent on fishing. These values are important to Chambers of Commerce, travel promotion groups, and local governments concerned with profit, economic diversity, jobs, and taxes.

We have just released a study of the economic value of fishing in Montana. In 1985 fishermen spent \$52.4 million fishing on streams and \$47.3 million fishing on lakes in Montana. This included transportation, lodging, food, guide fees and miscellaneous expenses. The average non-resident spent \$536 stream fishing and \$249 lake fishing per trip. Resident anglers spent \$36 stream fishing and \$62 lake fishing per trip. The average resident traveled 119 miles round trip to fish compared to 1,521 miles for non-residents.

We have not completed an economic impact analysis so I can not tell you specifically how these numbers relate to the Flathead Basin at this time. Using statewide averages the total expenditures would be \$7.8 million for lake fishing and \$3.9 million for stream fishing in the Flathead Basin in 1985.

We did not include fishing in Glacier National Park nor on the South Fork of the Flathead River, nor did we include fishing use on the Flathead Reservation by those who did not need a state fishing license in this study. Nevertheless, these numbers are impressive; but, to the fishermen, they do not necessarily reflect the value of the fishing opportunity. After all, expenditures are costs to the fishermen, not benefits. Most people try to keep their costs as low as possible to maximize their benefits.

Economists have also developed techniques to measure the benefits fishermen receive from their time spent fishing, as well as the value of different quality fishing opportunities. The benefits are referred to as net economic value. Economists measure net economic values by estimating what a fisherman would have been willing to pay in addition to what they actually spent per trip. The study just released by the department estimated the net economic value of stream fishing was $122 million and $93 million for lake fishing in Montana. Flathead Lake had a net economic value of $6.8 million and all lake fishing in the Flathead including Flathead Lake totaled $17.5 million. Stream fishing in the Flathead totaled $8.2 million. The combined total was $25.7 million accounting for twelve percent of the total for the state in 1985. (Once again these do not include fishing in Glacier Park, the South Fork of the Flathead, nor those fishing without state licenses on the Reservation.)

Another study conducted by our department in 1983 looked at the potential impacts of proposed small hydropower development on the fishery in the Swan River Drainage. An interesting aspect of this study was the documentation that the value of a fishing trip can vary significantly depending on the species the fishermen were pursuing. Those fishermen that were seeking trophy-sized bull trout placed a value on their trip 15 times larger than those fishermen that were not targeting any specific species of trout.

The department's recent statewide survey of trout stream fishermen found similar results. Fishermen classified as specialists (anglers who tend to fish with specialized gear, for a specific species, and in select waters) had a net economic value per trip of $170 compared to only $7.56 for those classified as occasional fishermen.

It is also important to note that these studies measure the recreational value of fishing. They do not attempt to put a dollar value on a fish. There are many other values which these fish may possess such as cultural, scientific, aesthetic, ecological and spiritual which were not measured in these studies.

So what does this all mean? As I said earlier, there are several ways to measure value and each way is important for specific uses. The dollars spent by fishermen are substantial and contribute to the diversity of the local economy. The expenditures by non-residents are important from a statewide perspective. However, the expenditures by residents are also important in that they bring important revenue to many smaller communities at least seasonally.

The net economic values, or benefits, to fisherman are also substantial, not just for Flathead Lake but for the many other waters in the Flathead. They reflect the quality of fishing opportunities and can be viewed as a measure of the attractiveness of these opportunities. These numbers are the same type of values used by agencies like the U.S. Forest Service in their planning. The values calculated in this study are more accurate than any numbers previously used by federal agencies in Montana.

These values can be used in forest plans and other models in assessing the benefits and costs of decisions that will affect the allocation of competing resources. A good example is the project funded by the Bonneville Power Administration to evaluate the impacts drawdown of Hungry Horse Reservoir will have on the fishery. The recommendation our department will make to the Northwest Power Planning Council in 1989 will now have a component on recreational values. This may affect the frequency and extent of future drawdowns, and better justify mitigation measures.

Economic values of fishing can also justify increased expenditures in program areas which enhance fishing opportunities. For example, the U. S. Forest Service has recently initiated the 'Rise to the Future' program to enhance fisheries on national forest lands across the country. They should be able to use these values to gain support for expanding this program in Montana.

These values can be used by our department in preparing management plans for the waters of the Flathead. Decisions on developing access, stocking fish, enhancing habitat, and biological surveys will begin to include the added dimension of economic values.

The most visible of these management plans will be the one we are preparing jointly with the Confederated Salish and Kootenai Tribes on Flathead Lake. Several alternatives will be assessed, each with their own strengths and weaknesses, their own costs and benefits.

For example, if supplemental stocking of kokanee was determined to be both viable and a preferred option for anglers, we would then need to weigh the costs of a hatchery program against the fishery benefits. An indicator of potential benefits would be a comparison with the net economic value of the fishery on Lake Koocanusa which had a net economic value 60% higher than Flathead Lake in 1985.

We are still limited in using this information to differentiate between the value fishermen might place on seeking trophy lake or bull trout compared to cutthroat or kokanee. Our present information is not refined enough to differentiate these values.

The Flathead Lake experience also illustrates the dynamic nature of the recreational values of fishing. The numbers calculated in 1985 are undoubtedly lower than they would have been a few years earlier and today they would likely be lower than in 1985. They are, after all, a reflection of the value fishermen place on the quality of the opportunity.

Some of the changes in the fishery may be related to water quality, others are not. In the case of the Flathead Lake fishery, the decline in the kokanee is probably unrelated to water quality. Nor will the solutions likely be directly related to water quality.

The reality of managing fisheries in relatively low productivity waters like Flathead Lake is that, the ecological balance can be much more easily upset than in those waters which are more productive. We must be very conservative in our future approaches to management to insure we do not further imbalance the ecology of Flathead Lake.

This symposium has generated discussion on many factors which can affect, and be affected by, the quality of the water and life in the Flathead. Your native fisheries may be the best symbol of how many actions and decisions which occur each year in the basin are bound together. Not only do these fish move downstream with the flow of water, they must also move back up and spread out through the basin to successfully complete their cycle of life. These native species depend on the quality and quantity of water throughout the basin.

There are also parallels between our economies and ecological communities. Those which are productive and diverse tend to be more stable. Traditionally, fish and wildlife have not been viewed as significantly contributing to Montana's economies, but increasingly communities recognize that they can contribute to the diversity and thus stability of the local economy. Communities are also recognizing that having quality fisheries is not always an either/or decision with respect to other activities as it has often been characterized.

In closing, I believe that despite the present problems with the Flathead Lake fishery, the future can be bright. The Flathead basin is the last major stronghold of migratory bulltrout and westslope cutthroat trout in Montana. The Flathead also provides the best lake trout fishing in Montana and the little utilized lake whitefish. The many lakes and streams also contribute to a fishing diversity unparalleled in the state. And those who depend on the Flathead for recreational opportunities and those who benefit financially must learn to adapt to this diversity and recognize that it tends to be more dynamic than stable.

Remember too, that when trying to make sense of dollars and fish, dollars and cents do not tell the whole story. What we measured in our studies was the value people placed on a fishing opportunity in the Flathead. The total values are the accumulation of many peoples perceptions and experiences. As I mentioned earlier some come to fish for a certain species in a specific water while others put more value on the solitude, scenic beauty or the opportunity to be with family and friends.

It is important that the quality of these opportunities be maintained or people will recreate elsewhere. Since quality can take many forms, the people of the Flathead must focus on the qualities that are unique and important to the fishing opportunities in the basin and act to sustain them. For example, clean water, while not necessarily contributing to the quality of the fishery in Flathead Lake, may be a significant contributor to the quality of the fishing experience.

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TOURISM AND THE REGIONAL ECONOMY

NICK A. HAREN

Executive Vice President
Kalispell Area Chamber of Commerce
Kalispell, Montana

Tourism's economic impact in any community can be difficult to pinpoint. But in Montana, without regular data from a general sales tax and continuing research from a University system, the tourism industry is more like a Loch Ness monster. Now you see it. Now you don't. We know it's here. We think it's big, but we can't definitely prove how big. And as a result, people tend to ignore or dismiss the importance of the industry in the overall economy.

Recently, the Legislature gave the industry some assistance in raising money to promote itself when a bill allowing for the collection of a sate-wide accommodations tax was passed. A very important secondary benefit of the bill will be the data tracking the collections of the tax and comparing them to future years, seasons, and even months. The accommodations tax will become a valuable measuring stick for the tourism industry, and a portion of the tax is earmarked for the university system to conduct research in the industry's behalf.

Without data of this sort, we must rely on travel expenditure data supplied by the state's travel promotion office and then apply extrapolated information from the most recent 1983 University of Montana study of the travel industry. This was done in a 1987 market analysis of the Flathead tourism industry by the Blake Agency of San Francisco. According to the Blake Agency study, Flathead County's 1985 market share of Montana tourism as a whole was 10.56% or $95,000,000. Though 1986 travel expenditures slipped a bit state-wide, they didn't appear to fall off in the Flathead and local indications show continued growth through 1987. Even conservative 1988 projections are showing strong growth for the industry in the Flathead.

Another indication of the sizable tourism industry that exists in the Flathead is beginning to surface in the first three quarters of accommodations tax collected since July of 1987. Montana is divided into six tourism regions (or countries) with Glacier Country composed of seven northwestern counties including Flathead. Accommodations tax collections from the seven counties in Glacier Country surpass the country with the next highest collections by $250,000 for just the first two quarters of the year. The state is projecting that a full year's tax collections will approximate $1.3 million from Glacier Country alone. And of the seven counties in Glacier Country, Flathead collects a large portion of the country's total.

Yes, tourism is big business in northwest Montana and particularly in the Flathead. How much of it depends on water is again difficult to accurately assess.

Much of the industry's growth is simply due to a discovery of the Flathead by the traveling public. We've had considerable more media exposure of the area this past year as a result of hosting the annual Outdoor Writer's of America conference in June 1987. The impact of their production will continue to be felt for years to come. The writers attending the conference were awe-struck by the natural beauty of the area. Mountains and valleys lush with forests, wildflowers, abundant wildlife, and yes - fresh water everywhere feeding that vibrant ecosystem. They simply couldn't believe it. This was not the image they held of Montana. They immediately fell in love with it and vowed to return as most tourists do.

But within this love story we all share for the Flathead also lies the potential problem. Will we love the Flathead to death with growth and more particularly unmanaged growth?

Flathead county, unlike most Montana counties has experienced steady population growth for at least the last 30 years. Many indicators suggest that growth may even accelerate with increased efforts to not only promote tourism but also recruit new business to the area. I am personally convinced that the valley and surrounding area will continue to experience growth from a developing tourism industry and successful business recruitment and expansion. But quite frankly I fear the possible results. Please don't misunderstand and label me as a "no-growther". I do feel there is considerable room for growth, and as the CEO of the Kalispell Area Chamber of Commerce I work daily to promote business growth in general. But it is now time and probably even past time to begin to manage our growth. Why? For the future folks. Yours, mine and our children's. Everybody wins with well managed, quality growth. Maintaining the natural scenic beauty of the area not only enhances the tourism industry's future but also protects a quality of life that both attracts new business and preserves the aesthetic values that we all enjoy as residents.

I sincerely believe the Flathead may be on the verge of an accelerated growth cycle that will demand our wise management of water and land beginning today.

When the Blake Agency conducted their market analysis of the Flathead, they listed "great natural beauty" as the number one strength of the area. It goes on to say, "This extraordinary advantage may be so powerful that it overcomes most disadvantages all by itself".

It doesn't take a Harvard PHD to understand that clean, fresh water plays a vitally important role in contributing to the tremendous natural beauty we humans so enjoy here. It also is extremely important to a growing, prosperous tourism industry.

If you don't believe so, just imagine yourself as a business owner in any tourist community in the country where the media runs a story about contaminated public water supplies that may pose a health threat to those who drink it.

What would go through your mind if you heard of even a possible food poisoning incident at a restaurant you occasionally ate in? The same is true of a water related problem. Tourist would shy away immediately.

This may seem like scare tactics that can only happen back east, but they can happen anywhere when man takes clean water for granted. And unfortunately, it seems to be human nature for man to take his surroundings for granted. We many times only realize how precious and fragile those things we really love and enjoy are when they are suddenly taken away or damaged. And then quite often it is too late.

Recently, I watched and outdoor adventure film on TV that showed visitors horse packing through the Great Bear Wilderness and rafting on the North Fork of the Flathead River. The exceptionally clear and clean water was continually mentioned during the narration.

The recently completed economic development promotional video, produced by Pacific Power and Light, heavily promotes the area's quality of life as it should. The natural beauty of the area and recreational opportunities within it are major assets. We often refer to our natural surroundings as resources and material goods as assets. I would like to suggest to you that we begin to think of our natural resources as assets.

A couple of weeks ago I was asked if I thought our present tax structure was a burden to further economic development efforts. I answered that every community in the country had particular economic liabilities, but I felt our liabilities were far outnumbered by our assets. We merely need to concentrate on managing our assets while working to convert more liabilities to asset much as we would do on our own financial statements.

And so it is with the Flathead's water. It's an extremely valuable asset that must first be recognized and then managed for the future. For the future of tourism, yes. But for the future of the entire economy of the Flathead.

Economy. That is a really big thing. When I think of a good or healthy economy I think of balance and harmony, like a finely tuned engine with its parts all working together to create energy, or that which exists between organisms and their environment in a pristine mountain pond. We are all organisms within our environment. But we, unlike other life forms, have the power to effect changes in our environment and thereby manage our future for better or worse.

Sig Olson, well known outdoor writer and author of numerous books, wrote about "balance and order" in Reflections From The North Country. He said, "Aware at last of our relentless drive for economic development and an ever-higher standard of living at the expense of dwindling resources, and the swiftly mounting degradation of environment and beauty of the natural scene, we are beginning to realize our future course can no longer be at the expense of quality in our lives. Only when we see ourselves as members of a balanced community, can we successfully".

The mere fact that we've all come together for these past two days to discuss water quality in the Flathead drainage gives me great hope for the future. We've been made aware in this conference of the world-class water quality we enjoy in the Flathead. What a tremendous opportunity we have to set an example right here for all mankind.

"The Cost of Clean Water"

Christine Olsenius
Vice President for Education
The Fresh Water Foundation

We have been spending a lot of time talking about change; change in attitudes, change in behavior and change in management. But change is easier to discuss than to do. I'd like to share an anecdote with you about change and the challenge of preparing for the future.

In 1938 President Roosevelt assembled some of the brightest scientists in America at the White House to help him envision the things he might have to adjust to in the near future. After 3 days of intense speculation, these men who commanded more keys to the future than any other group, failed to predict atomic power, radar, rockets, jet aircraft, computers and penicillin.

Now you might say the reason these men did not predict technologies that were not even ten years away - was because they didn't have any entrepreneurs, in the group or historians like Harry Fritz. I feel because they didn't have any women - they lost a tremendous amount of perspective.

Whatever the excuse, this event hightlights a continuing challenge to an increasingly complex society.

How can we plan for the future - based on the mindsets of today. This is a particular challenge to water issues where we are just now understanding the implications of things we did 10-20 years ago. What are we doing today that we'll regret in the next 10-20 years.

Are we looking at water issues in the Flathead with the kind of perspective which will allow us to deal with the magnitude and complexity of the issues we face.

This morning we have discussed the economic future of the Flathead's resource base. We have looked at the importance of clean water to the economy, to agriculture, to industry and tourism. But we have not looked at the cost of clean water or the price we may have to pay to ensure clean water for the future, and all good things have a price tag.

In my presentation I will discuss the potential economic impact of groundwater contamination on municipalities, and businesses in the Flathead.

In the Flathead valley there are six groundwater sites that may be investigated in the near future; two abandoned landfills, two post and pole treating sites and two industry disposal sites. Final clean up for the Somers site is due this fall.

Never has an environmental issue been so closely tied to public health as groundwater contamination. The average landfill is becoming a source of water contamination in thousands of communities across the country. The average homeowner produces 1 lb. of hazardous waste per year. In a community of 20,000 people that is 10 tons of hazardous waste going into the local landfill. Leaking underground storage tanks like gasoline tanks go undetected for many years by communities. Twenty-three states have detected pesticides in groundwater.

Because groundwater is often untested and untreated yet used by such a large number of people, groundwater and its potential public health implications have made it one of the environmental issues of the decade.

The Freshwater Foundation has recently undertaken a study to profile the hidden costs of groundwater contamination to municipalities and businesses. We surveyed 20 cities and their utilities and 20 businesses with known groundwater contamination problems and asked them to quantify such things as diminished homes sales, diminished commercial real estate sales, devaluation of residential or commercial property, relocation of commercial property, loss of tax revenues, increased legal fees, lost staff time and increased soil and water testing. The questions varied somewhat but similar patterns of costs emerged. I'd like to share some of the case studies with you, because they are all local reflections of a national problem and they provide a unique perspective on the hidden price of pollution.

City A, with a population of less than 5000 people had a paper company which discovered groundwater contamination on a wood process disposal site. There was no contamination of the municipal water supply, so there were no direct costs to be paid by the city, but here are some of the indirect costs that were paid.

1) Forty-six homes were devalued due to their proximity to the contamination site. Devaluation was estimated at less than $100,000.

2) A nearby food processing plant was devalued doe to its proximity to the site. Devaluation was estimated at less than $100,000.

3) Partly as a result of the contamination problem, the paper company moved out of the state. The impact is estimated at $500,000 to $1 million. (An employee run facility remains but had to relocate at a "cleaner" site).

4) 38 people were laid off when the paper company left town.

5) The city lost $40,000 in potential tax revenue.

The industry that was the source of contamination in City A spent the following amount of money.

1) $100,000. - 250,000. was spent to drill new wells to monitor and define the extent of groundwater contamination.

2) $500,000. - 1,000,000. was spent on additional staff time to address the problem.

3) $500,000. - 1,000,000. was spent on soil and water testing.

4) Between $1-2 million was spent on construction of a vault, a groundwater pump, to pump out wells and carbon absorption treatment facilities (the actual cleanup activity).

City B, with a population of 1700 people found industrial solvents had leached from a local landfill into groundwater. Trichloroethane was found in 60 private wells and since the contamination is in the well field for a larger adjacent city, a major municipal source may be compromised.

The immediate impact was felt in the unincorporated township where bottled water was provided for 400 residents. A new municipal treatment plant and sewer system was constructed at a combined cost of $1.8 million.

Municipal bonds were issued over three years to pay for construction. To pay the bond revenue, an FHA loan was required at a cost of $48,000 interest over 30 years. In addition the township had to be bonded at a cost of $1800. per year and audits will have to be conducted at an annual cost of $2500.

Before the incident, the township's budget was $5800. per year. It will more than double with the new facilities. Long term operation and maintenance is still unknown. The user fees for municipal water went from $13 to $35 per month.

City C with a population of 13,000, had a high nitrate content in private water supplies in part of the community that was not served by a public water supply. The source of the nitrates was thought to be septic systems and nearby agricultural activity. The nitrate problem was a factor in slow home sales until the approximately 40 affected homes were connected to the municipal water supply.

City D with a population of 350 people, experienced contamination of two municipal wells with benzene, dichloroethane and other volatile organics. The source of contamination was leakage of underground petroleum storage tanks from three companies.

100,000 to 250,000 in home sales were lost to adjacent communities because of the contamination. A carbon filtration plant was installed for approximately $100,000 paid for with Superfund money. But the city will have to get a small cities grant to drill a new well. Other increased operation and management costs will be passed on to local residents in their utility bills.

Company D, a suburban manufacturer of electronic devices bought property that had previously been the site of a wood treating operation. Contamination of groundwater was discovered on the property after the conmpany purchased the site. The contamination has decreased the value and salability of the business facility. It is assumed that financial installations would not mortgage or use the company's facilities as security for financing. Expanded facilities on the site would not increase their market value so any expansion will occur elsewhere.

The company has spent between $250,000 - 500,000 on consultants and staff time; $100,000 - 250,000 on legal fees; $100,000 - 250,000 in well monitoring and $250,000 - 500,000 for excavation, transportation and disposal of contaminated soils.

The surveys found that in addition to direct clean up costs, groundwater contamination increased expenditures for legal fees, monitoring wells, soil and water testing, and staff time and has adversely affected real estate values and ultimately tax revenues.

According to real estate analysts, soil and groundwater contamination on a potential development site reduces the value of the real estate by the cost of the clean up. More industries are testing for soil and groundwater contamination before buying property. The prevalence of soil and ground water contamination in some areas is shifting development from urban sites to undeveloped property in suburban sites, as businesses try to avoid the increased costs associated with the clean up and liability of previously used land.

A banker recently told me that in one case where a company went bankrupt leaving behind a contaminated site, the bank wrote off the loan against the property rather than repossess the property and assume its liability.

And speaking of liability - in Connecticut, 5 farmers have been found liable for the contamination of 280 private wells. There will be appeals and new legislation, but the farmers are encumbering great financial risk and that may force them out of business.

You can no longer say what you do on your land is your business if it affects groundwater.

These case studies highlight many hidden costs of water pollution to local communities and businesses and the need for more preventive management of sources of contamination, such as underground storage tanks, landfills, industrial wastes, septic systems and agricultural chemicals. In all cases prevention would have been cheaper than clean up and remediation.

We often complain about the cost of environmental regulations but we also pay a high price for environmental degradation. We pay both ways, but prevention costs us less. The hidden costs of water pollution are insidious and will have an adverse affect on local economic development. We can pay for prevention today in 1988 dollars or we can pay for clean up and remediation in 1999 dollars. This is true for surface water as well as groundwater.

The past decade has seen an increase in water quality programs. The Clean Water Act, The Safe Drinking Water Act, Superfund, and new proposed groundwater legislation clearly reflect a growing national concern over water quality and a loss of faith in the quality of America's drinking water. In a recent poll of state health administrators, drinking water quality was their primary environmental health concern.

Sophisticated technology allows for the detection and measurement of contaminants in water supplies in minute quantities. And while our risk assessment techniques do not provide us with conclusive proof regarding their health effects, the long term exposure to numerous contaminants, their synergistic effect and their contribution together with other sources of exposure, like occupation and nutrition have led to a cautious, preventive approach on the part of many public health agencies. Economics and public health are becoming the new politics of water quality. Economics and public health are the driving forces behind water policy, regulation and management.

The newly passed Safe Drinking Water Act will set water quality standards for 83 contaminants over the next three years. These standards will cover volatile organic chemicals, inorganics, microbial contaminants, radionuclides and disinfection by-products. It is estimated that annual monitoring of community water supplies for all these substances will add millions of dollars to the cost of water treatment.

Over the next five to ten years, the EPA will go from regulating slightly more than 20 contaminants up to at least 150. The Safe Drinking Water Act is a mechanism which puts into place a continuous process of evaluation and regulation of new contaminants. It will require a long range financial commitment to fund the monitoring aspects of these new requirements. Large utilities will have the option of spreading the added costs over a larger base. For smaller utilities, the incremental cost per unit will be sustantially larger.

From a quality standpoint, water will become increasingly expensive to keep usable for public drinking water supplies and high quality industrial uses. Water pollution will raise utility bills and taxes and increase the need for general revenue bonds.

Americans today pay an average of one tenth of one cent per gallon for drinking water. With the upgraded monitoring and treatment proposed by the Safe Drinking Water Act, the cost of obtaining higher quality drinking water could as much as double to two-tenths of one cent per gallon.

We've spent two days talking about how important clean water is to the future of the Flathead. But here's what you currently pay for water:

Polson - $1.76 per 1000 gallons
Kalispell - $1.15 per 1000 gallons
Big Fork - $1.18 per 1000 gallons
Columbia Falls - $1.34 per 1000 gallons
Whitefish - $1.50 per 1000 gallons

But to put this cost in perspective, look at the prices we currently pay for substances which are largely water; $1.91 for a gallon of milk, $2.19 for a gallon of cola, $4.90 for a gallon of sparkling water, and $78.00 for gallon of scotch. Even if the cost of water does increase 100 percent, it appears to be a bargain.

There is a need for the business community, state and municipal agencies and individual taxpayewrs to prepare for the inevitable changes in prioritizing and financing of water supply systems, wastewater treatment facilities and groundwater monitoring and remediation.

These are issues that have a long-range impact on regional economic development.

People don't come to Montana to find pollution. They come to experience beauty, wilderness and an abundance of natural resources. When perceptions change due to environmental problems, the "market" changes. The economic value of the region changes.

Water quality is part of the attraction of the Flathead Basin, but nobody said water quality would last forever or that clean water would be free. Like everywhere else in the country, you get what you pay for.

Too often environmental protection discussions are framed in either - or terms, as if you can only have environmental quality or economic development. As we all become more aware of the hidden costs of water pollution, it is obvious that the ecology and economy of a region are linked. It is impossible to separate long range economic development from a long term sustainable resource base. And the quality of that resource will determine the quality of the economy.

Eleven years ago over 300 people came together to discuss water problems related to Cabin Creek and the North Fork of the Flathead River. There was a threat, everyone was excited and ready to fight.

Today you have mapped, measured and monitored many of your water problems and you face the less glamorous but more critical challenge of implementing specific water management practices. What are those practices, who will implement them, who will pay and how much will they pay? These are the decisions you must begin to make.

It's time to get water management out of theory and into practice, before it's too late for the Flathead Basin.

AUDIENCE QUESTIONS & ANSWERS

The Flathead's Resource Base - Perspectives for the Future

Questions for Senator Max Baucus

Gil Lusk: Senator Baucus, how can we maintain a quality environment and sound economic base and weave them together?

Senator Baucus: We need to have good baseline data in order to make sound resource decisions. The biggest problem associated with water quality is that ten to fifteen years down the road problems could arise and we need to know about them now. In Montana, tradeoffs between clean water and economic gains are not acceptable. A portion of our economic base is based on clean water and a tourist economy. We need to advertise Montana to the rest of the nation. People don't know about our state and what it has to offer.

Brace Hayden: Is there a national effort to draft legislation regarding groundwater?

Senator Baucus: Presently, very little is known about groundwater and we need to learn more. Fundamentally, I believe groundwater issues should be left to the individual states to handle. National problems remain and need to be addressed for aquifers and rivers that cross state lines.

Questions for Keith Kelly

Steve Dagger: Mr. Kelly, you made references to weeds growing in the small ranchettes. I have a question as to whether there is any movement towards no-till agriculture, which is something that seems to alleviate that kind of problem?

Keith Kelly: Yes, it may. No-till agriculture is also chemical intensive. It saves on diesel fuel because you don't have to work the ground so many times but it requires alot of chemicals. What we are trying to stress at our department is integrated pest management which is going to require chemicals at a reduced rate, biological control, and tillage for mechanical practices and farming practices. You have to look at it in a total context like land, air, and water. We need to look at all of the alternatives.

Brace Hayden: Keith, would you expound on the new agriculture in the valley such as the potential for expanding mint and other specialty crops. What does the long term potential for this host?

Keith Kelly: The mint industry here was about 1000 acres last year and it is projected to be 1300 acres this year. It has grown about 30% per year. We raise a very high quality of mint with a very low rancidity level, which tends to have a better shelf life. It is a labor intensive agriculture that has a potential, both here and in Lake County, for significant growth.

There is also a national beef packing plant in the area. In Somers, there is an intensive effort underway in the huckleberry industry. The amount of dollars associated with the huckleberry industry is enormous. Seed potatoes have also been here for a very long time as well as Christmas tree farming. We are going to explore some specialty items such as onions or snow peas. The climate, moisture and the soil is certainly good here. The entrepreneurial shift seems to be trying to seek out some of those particular specialty crops.

Questions for Clint Grimes

Bill Parson: I am reminded of some recent marketing and strategic planning sessions I have been to with our company in Seattle. Some of the things that you talked about are indeed happening here in the Valley. It is not just talk. In addition to the fiber density board that you mentioned, we have gotten into several other product lines that may be of interest to the group. One is a thin, 1/4 inch board that the Japanese use to put a fish tape material on. The Japanese don't have alot of wood left so they are using their own wood as a veneer over a laminated beam which is made out of materials that we formerly made 2x4's out of. I agree with Mr. Grimes, it is a trend, and a world market.

Clint Grimes: I would just like to add that I am not in the employ of Plum Creek but they are, for a large company, a pretty heads-up company. I say "for a large company" because I think some of the small companies make decisions quicker and do things faster. It is important to recognize that you really do have some premier employers in the wood products industry. They are not just slicing up 2x4's.

Unknown Questioner: Is there any water quality implication associated with the kind of business you are talking about versus cutting studs and so forth?

Clint Grimes: Yes, depending on the type of manufacturing. There are some environmental considerations every time you begin a manufacturing plant. The people and what they do can cause problems for any environment. The fact is, that if you are going to have employment in the wood industries, you are going to have some wastes to handle.

Bill Gould: Mr. Grimes, you mentioned having to go outside for your investment capital; are there other elements in the package that we also lack? Is there a need to do something in a way to encourage designers of furniture in the area, people to generate the ideas. We have had some exposure to a furniture plant in the Missoula area and it seems to have had some problems. How do we encourage further development?

Clint Grimes: The thing I would like to stress to you is that if you want to see this take place, you have to attract a manufacturer. You must be in a position of having some capital and infra-structural help for these people who want to start up. One of the problems that you have here is lack of cultural amenities to attract manufacturers.

Mark Simonich: We have a timber supply problem in the state of Montana and we are having a difficult time getting the attention of some of our political leaders to recognize that it is a supply problem and not a manufacturing or a profit problem. Do you have some suggestions on how we may deal with that so that we can bring some of these value-item plants into Montana?

Clint Grimes: Yes I do. I would like to see a manufacturing plant here. In the Dillon area, we have a very serious situation. You have a Forest Service plan that is going to limit production to 17 MMBF annually from that area, which is well below what it produces. This is a result of an ideological posture that has been successful on the part of certain political interests. It means that there is 30 MMBF of timber being traded for 29 elk.

Questions for Pat Graham

John Frederick: Mr. Graham, how much damage to the Flathead drainage fishing economy might be done by the proposed Cabin Creek mine in Canada?

Pat Graham: The full extent of the assessment by the International Joint Commission would document what the impacts are going to be. From that, we can use this information to determine what the economic impact might be. That linkage has not been made, that I know of.

Questions for Nick Haren

Craig Spencer: Mr. Haren, would you please discuss some specifics on future growth?

Nick Haren: We have to recognize that we have potential future problems that may threaten the quality of the environment. The fact that we are together for this conference is an enormous first step. There is a need for wise management to achieve a balance between protecting the environment and future economic growth.

Ed Brannon: There is a need for reasonable planning and land use controls. How do you feel about that?

Nick Haren: In Kalispell, it is evident that there has not been good land use planning. It is extremely important that we do not distract from the natural quality of life that attracts industry and people to this area. There has to be a balance between economic growth and maintaining the quality of life in this area.

Unknown Questioner: Mr. Haren, what can the Chamber of Commerce do to make people more aware of the Valley's planning needs?

Nick Haren: The Chamber is "you" as well as it is "me". The most effective thing the Chamber can do is work with each and every one of you. We must work with and support the elected officials. But it also starts at the grassroots level. It is very important that the Chamber take a leadership role.

Questions for Christine Olsenius

Craig Spencer: Ms. Olsenius, where are the six hazardous waste problems in Flathead County, that you referred to?

Christine Olsenius: The Solid Waste Bureau has a list of the six sites. There are two landfill sites in the Kalispell area; two post and pole plants, and two abandoned oil refinery sites.

Unknown Questioner: How does the Flathead area compare with the rest of the country with regards to hazardous waste problems?

Christine Olsenius: There is a ground water contamination problem in every state. The West, in general, is lagging behind other states because of low population and lack of industry. The problems in the Flathead Basin are manageable but we must deal with the problems early before they become very costly to correct later.

Steve Herbaly: What is the potential for ground water regulations as well as a possibility for the County to become involved? What is the future relationship of the Flathead Basin Commission and the Freshwater Foundation?

Christine Olsenius: There are six bills pending on federal legislation concerning groundwater. The federal government recognizes that it is a local problem. It is very important for the local community to become involved. The federal role is more technology transfer.

Funding for the Flathead Basin Commission was on a sliding scale with staff salaries to be found from other sources after the first year. The Freshwater Foundation hopes to continue with support for the Flathead Basin Commission's endeavors.

REMARKS OF GOVERNOR TED SCHWINDEN
AT THE FLATHEAD BASIN COMMISSION SYMPOSIUM: "OUR CLEAN WATER: FLATHEAD'S RESOURCE OF THE FUTURE,"
ON TUESDAY, APRIL 26, 1988,
IN KALISPELL AT 11:45 A.M.

When I saw that my remarks for today had been entitled "Water Quality, Economic Growth and Politics," my first reaction was that any one of those three subjects would be worth, if not an entire college course, then at least a lecture worth one credit. While that course obviously could be taught by a biology, economics or political science professor, it could just as easily be taught by a Montana history professor. After all, the development of this state has been inextricably tied to questions of environmental quality, economic growth and politics.

The focus of this conference is the future, as it should be. But I would like to spend a few minutes discussing Montana's historical ties to resource issues, because, as William Shakespeare wrote, "What's past is prologue." When you think about it, it's fairly remarkable that a generally conservative bunch of Montanans have repeatedly passed progressive resource protection legislation that often has become a model for national legislation. But that is not so surprising when you remember that the root of the word "conservative" is "conserve."

Ironically, that 'conserve-atism' has translated into progressive resource policies that have put Montana in the forefront of responsible government activity to protect our resource base. This state has amassed a remarkable record of resource legislation in the past two decades. The strip mining reclamation act, the environmental policy act, the facility siting act, the resource indemnity trust fund, the coal severance tax are just a few prominent examples of Montanans' commitment to balanced growth.

It would be too easy to attribute that progress to the lessons of the Berkeley Pit or the Clark Fork River. Our commitment is much older than Earth Day. It extends to the core of those who settled this state, of those who were tied to the land for their livelihood...not the fly-by-nighters who only stayed long enough to grab the riches before the vein played out. The families who planted their lives along with their crops in this arid ground were determined to make a go of it, and intent upon turning their land -- still productive -- over to their children some day. It was there that the seeds of reclamation policy were planted. In 1947, Roland Renne wrote in his book Land Economics," Best land use...means not only improved living conditions, but improvement maintained on a relatively permanent basis." (emphasis added).

Legislation in the 1930s establishing grazing districts and conservation districts turned public policy into public action. Although the grazing districts were established by federal law, the first one--Mizpah-Pumpkin Creek in Montana--proved to be a model for other districts in the West. Since the Dust Bowl days of the 1930s, Montana's conservation districts have worked to promote the wise use, conservation and development of our water, soil and other natural resources.

In the 1930s, Joseph Dixon became the first governor to try to ensure that Montanans received an adequate return from the extraction of minerals, when he proposed mine-mouth taxation of Anaconda copper. That Montanans took all these actions in the midst of the 1930s, when the Depression was pounding them as much as other Americans, is a measure of the level of commitment and foresight of the people of this state.

That commitment has been demonstrated time and again in Washington, D.C., where Montana's congressional delegations have had a long history of advocating federal legislation that recognize the importance of wildlife, wilderness, public lands, water quality and other resources. It is impossible to separate our political achievements regarding resource policy from the active day-to-day involvement of Montana citizens in those decisions.

Montana's long populist tradition has guaranteed that the people of this state will have a say in their future, that they--not a bureaucracy 200 or 2,000 miles away--will dictate the policies and programs that will guide the growth of this state. Montana's record of resource protection and economic progress has been the result of citizen activism and public support. It has spawned groups such as the Northern Plains Resource Council, the Environmental Information Center, Friends of Yellow Bay, the Flathead Lakers, to name a few.

Montanans are equally committed to a strong economy. That's why groups such as the chambers of commerce, the Coal Council, the Petroleum Association, the Wood Products Association exist. Nearly every Montana poll I have seen reflects our traditional dilemma: over two-thirds of those polled state that quality of life is a primary consideration for living in Montana. Two-thirds to three-fourths regard economic development and jobs the top priority. That is why in creating our legacy of resource legislation, Montanans have sought to strike a balance between the two. Our goal has been to meet the needs of one without trampling the needs of the other.

If, indeed, "what's past is prologue," then Montana's tradition of progress and protection--of balancing economic growth with resource protection through active citizen involvement--should bode well for the future of the Flathead. The work of the Flathead Basin Commission attests to Montanans' continuing efforts to achieve that balance. As the legislation creating the Commission indicates, its mission involves both monitoring the condition of the basin's natural resources and supporting economic development that does not compromise the basin's aquatic system.

The people of the Flathead have had an extensive education in water quality, economic growth and politics during the past few decades. The progress that has been made in the basin since the Section 208 study is a tribute to the unusual -- and effective -- partnership of federal, state, local and tribal governments, private industry and concerned citizens. Groups like the Flathead Coalition were instrumental in convincing our congressional delegation to take the findings of the 208 study a step further.

The resulting Flathead River Basin Environmental Impact Study marked the first time that such a federally funded study was managed successfully by local citizens. The wide range of subjects addressed by the study's regional steering committee included population growth, economic development, government, climate, recreation patterns and fish and wildlife characteristics. Information on those subjects formed a data base of resource conditions that changes could be measured against. The environmental impact study's findings led to the eventual creation of the Flathead Basin Commission.

The study took five years and created a well-informed pool of local citizens in the process. Today, ten years after the regional steering committee began its work on the environmental impact study, and five years after the establishment of the Flathead Basin Commission, the communities in the basin deserve much credit for the progress that has been made to date. The presence of so many Flatheaders on the agenda of this conference indicates that you have made the transition from student to teacher.

The public education efforts of the Commission and public involvement in water quality issues concerning the Flathead Basin have had concrete results: legislation allowing local governments to restrict the sale of phosphate detergents and the implementation of a requirement that phosphorous be removed at municipal sewage plants discharging into Flathead Lake or its tributaries. The Commission has also successfully promoted a water quality monitoring plan, the first of its kind.

Those and other successes in the basin can be attributed to the hard work and sincere efforts of many people who care about this cherished area of northwest Montana--people who believe that clean water and a clean environment can be a strong drawing card to attract desirable businesses here, people like Elwin Bennington who has devoted many years to improving water quality in the Flathead Basin. Elwin is representative of the active, concerned citizens upon which government depends.

As state land commissioner, I received a letter from a woman who very courteously explained her concerns about oil and gas leasing near Glacier Park. The letter concluded, "I know that your efforts will lead to the overall pollution of the problem." I've always wondered if that was her sincere belief or a typographical error! But at least she was concerned enough to write.

Government relies on concerned citizens to direct us to problem areas. In Montana, the inevitable constraints of limited resources demand prioritization. An informed public is one of the best tools a democracy has to set those priorities. It was citizen outcry that brought the Cabin Creek coal mine situation to the fore. It was citizen ire that led to restrictions on phosphorous in Flathead Lake. It was citizen activism that led to the creation of the Flathead Basin Commission.

But citizens up in arms is not the answer alone. Citizens with constructive suggestions who are willing to work with government and industry to hammer out responsible solutions are the best assurance that economic development will go hand-in-hand with environmental protection in Montana. The Flathead Basin with its long tradition of citizen involvement is well equipped to meet the challenges of the future.

-END-

Establishing Priorities for the Future

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Brace Hayden
Executive Director
Flathead Basin Commission

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Ed Brannon
Chairperson, Flathead Basin Commission
Forest Supervisor, Flathead National Forest

Introduction, Section Moderator

BRACE HAYDEN

Executive Director
Flathead Basin Commission

Now that you have all been listening for one and a half days, this is your turn to do the talking. The Flathead Basin Commission is interested in having you, the citizens of the Basin, tell us where we should be concentrating our efforts. As the Governor has pointed out, an important responsibility of the Commission is making recommendations as to what can be done to preserve and protect water quality and then work to see that these changes are implemented. We also have the responsibility to promote economic development that is consistent with clean water.

About a year and half ago, Chairman Ed Brannon suggested that the Flathead Basin Commission create a list of priorities for guidance. We would like you to look at this list titled Flathead Basin Commission Priorities for the 1987-89 Biennium and see if you believe we are concentrating our efforts in the right direction, whether you agree or disagree with these, and tell us what is missing.

After dividing into eight groups, members of each group will discuss what they personally believe should be the next steps in preserving the Flathead's water resources and promoting economic growth. There are no right or wrong answers. We have no hidden agenda. All your ideas will be recorded for future use by the Commission. I urge you, don't be bashful. Be honest and candid. As the Governor alluded to, government only works best when it's in tune to the people's needs and aspirations.

To help the Commission in this exercise, we have enlisted eight skilled individuals to act as meeting facilitators for these small groups. It will be their job to keep each group focused on the task of listing the issues and then to prioritize them. We will report back together as an entire group to review the group reports.

SMALL GROUP SESSION

PRIORITY RECOMMENDATIONS

GROUP #1

1. **Grassroots**
   Citizen involvement
   (current methods not successfull)
2. **Comprehensive Land Use Plan**
   Public/Private lands
3. **Critically Review Timber Harvest Activities**
4. **Water Quality Curriculum For Public Schools**
   Flathead Basin Schools
5. **Public Information Dissemination**
6. **Improved Monitoring of Ground & Surface Water**

GROUP #2

1. **Continue Public Education**
   Water Quality Issues, Basin-wide
2. **Inventory All Sources of Pollution**
3. **Monitor Ground Water**
   Basin-wide
4. **Change FBC Structure/Authority**
   More effective problem solving
5. **Explore Basin-wide Regulatory Authority**
   Need for/public acceptance of

GROUP #3

1. **Promote Creative Financing to Commission**
2. **Ground & Surface Water Monitoring**
   Permanent sites
3. **Expanding the Commission**
   Provide greater community ownership
4. **Consistent FBC Rules & Regulations**
   Well defined procedure for change
5. **Promote Consistent Land Use Planning**
   Basin-wide

GROUP #4

1. **Public Education**
    A. Public support
    B. Change practices
    C. Costs/benefits of water protection
    D. Role of commission

2. **Monitoring Dollars**
    A. Water Quality
        1. groundwater - Evergreen/Co. Landfills
        2. surface water--Basin plan include coliform counts
    B. BMP's
        1. tighter regulations
        2. Riparian grazing codes
        3. Logging practices
    C. Baseline Data
        Nutrients, Bacteria, Sediment

3. **Develop Land Use Plans** (each county)
    A. Protects ground & surface waters
    B. Establish storm drainage policy to preserve natural drainage and buffer strips
    C. Maintain agricultural land in production

4. **Commission Representations**
    A. Mixture of agencies & citizen representatives
    B. Economic & Environmental interests and tradeoffs
    C. Types of activities desired
    D. Expand size

5. **Funding**
    A. Education
    B. Monitoring

GROUP #5

1. **Underground Water Sources**
    A. Determine problem sources
    B. Data base
    C. Evergreen

2. **Coordinating of Agencies/Governments**
    Including Community Education

3. **Open/Continue Dialogue with British Columbia**

4. **Stream Flow Regulations & Water Rights Issues**

5. **Land Use Planning** - data base established

GROUP #6

1. **Monitor Ground Water Now**
2. **Individual Pollution Awareness & Responsibility**
   Start at a early age
3. **Pressure Kalispell to Clean Up Municipal Wastewater**
4. **Establish Permanent Funding Source for FBC**
   Staff
   Programs
5. **Working Together**
   Under Plan Involving broad representation:
   Commission,
   Public, and
   Users

GROUP #7

1. **Develop Integrated, Comprehensive, Long-term Plan**
   Facilitated Negotiation Process
   Integrate: Fisheries, Land Use, Water Quality, Economic Development
2. **Increase Membership**
   Other Citizens to include Commercial, Forest, Industry & Others on FBC
3. **Secure & Explore Additional Funding**
   Research
   Monitoring
   Public information & awareness
4. **Emphasize Prevention Efforts**
   To limit N & P influx in ground/surface water
5. **Increase enforcement of Existing Regulations & Close Loopholes in subdivision laws**
6. **Continue Monitoring Hydropower effects on the Flathead**
   Investigate ability to influence decisions on a regional basis, ie. fluctuation

GROUP #8

1. **Quantify the Contributing Factors**
   Toward the Degradation of Water Quality
2. **More Control over Failing Septic Systems**
   Nutrients in Flathead Lake
3. **Land Use and Business Growth Planning (Zoning)**
4. **Reduce Cattle Access to Streams**
   especially from winter feeding areas
   divert runoff from these areas
5. **Possibility of FNF to Monitor Important Spawning Streams, within their monitoring program**

"Where Do We Go From Here?"

EDGAR B. BRANNON, JR.

Chairperson, Flathead Basin Commission
Forest Supervisor, Flathead National Forest

Last Saturday, many of us in the community attended the first in a series of programs called "Investment in Excellence." I learned a new term. **Possibility Thinking.** I learned some new, and reinforced some already held beliefs. As human beings we each create our own personal reality. We lock in to what we believe to be the truth and lock out what is not congruent with that belief. In doing so, we are self-limiting. We change the world by how we think ourselves. In fact, the only way we change is by changing ourselves.

- Achieving excellence is also a matter of thinking differently, not working harder.
- All meaning and lasting change starts on the inside and works its way out.
- We label ourselves the way we are rather than the way we want to be.
- We move toward the label we have of ourselves, our companies, or organizations.
- Without goals, people, companies, and organizations stagnate and die.
- Teleological mechanism doesn't care where it has been, only where it wants to end up.

This past two days has been another learning and growing experience for me. I can see new possibilities. The question is, where do we, as a Commission, go from here?

First, we need to keep doing what is working. Individual efforts are making a difference. We need to celebrate our little, small steps forward.

Secondly, we need to see what others are doing that works for them. Can it work for us too? Can we learn from each other?

Thirdly, we need to drop what is not working. Dump it. This sounds almost trivial, but I surprise myself regularly at how tightly I hang on to the familiar, even when all it brings is pain and failure. Why do I do this? As my Irish grandmother told me, "The Devil you know is better than the Devil you don't know." The unknown is scary, but if we are to grow that is what we must do. I believe it is time to freshen up our agenda. It is time to look forward rather than back. It is time to build better partnerships, use our strengths. Look for new things to try. I want to drop the finger-pointing and the adversary-way we deal with problems. Instead of projecting failure, let's point towards success. Let's join with each other in a new spirit of cooperation. Try it for yourself.

Lastly, we need to take what we heard here these past two days, and use it as a platform for our **New Agenda.** Let's set a new set of goals. Let's describe the future we want. What is our picture of the future?

From this session, I see some "common threads" that we can use as a commission to focus our efforts in the years ahead.

1. **Make-up and function of the Flathead Basin Commission.** It has served us well, but there is a need to strengthen this base. We need to more clearly define our role and how the make-up of the Commission serves that role.

2. **Success is Predicated on Stable Funding.** We need to develop a funding program that puts a share of the financial responsibility on the citizens of the Basin. The challenge is not to create another bureaucracy, but rather develop a network procedure that uses the strengths of groups and agencies that already exist in the Flathead Basin.

3. **Public Information.** It is essential that people have a source of credible, objective information. The Flathead Basin Commission can continue to take a leadership role in providing people with current and accurate information related to water quality issues in the Basin.

4. **Provide Support for Responsible Land Use Planning and Regulation in the Basin.** Many of the current problems can be tied to past inadequate or non-existent land use planning and enforcement. If we are to have economic growth and a quality environment, we cannot expect it to happen "by chance." The Flathead Basin Commission can be a facilitator and sponsor for responsible, citizen supported land use regulation.

5. **Monitoring and Evaluation of the Quality of Water in the Basin.** In cooperation with research scientists, governments, and citizens, provide a source for information on change in water quality. Our current program should be expanded to include groundwater, landfill sites, forestry practices, pesticides, and other nonpoint source.

This, in a way, is our New Agenda. An agenda **for us**, that meets **our needs** for our **bright future.**

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"It seems that water quality protection eforts collide with funding. Towns and individuals cannot afford costs at present but by not funding now, clean up costs may be higher later."

"The role of the citizen should be that of heavy involvement in all areas of water quality protection. We are the "stewards" of the state waters which, in essence, belongs to all Montanans."

"With regards to water quality protection efforts, more emphasis should be placed on preventive measures instead of doing more studies to see if a problem exists. The laws and regulations seem to be adequate however enforcement of those laws seems to be lacking."

"Continue with public education to make everyone aware of the impact of their own activities. Focus on nonpoint sources as well as point sources of pollution."

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THE FLATHEAD BASIN COMMISSION

The Flathead Basin Commission was established by the 1983 Montana Legislature to protect the Flathead Basin's aquatic environment, waters that flow into or out of Flathead Lake, and other natural resources of the Basin.

The Commission is made up of representatives of federal, state, local and Canadian agencies, as well as tribal, private and citizen interests. The Commission is charged with the following tasks:

- monitoring the Basin's natural resources;
- encouraging cooperation among Basin land managers;
- holding public hearings on the condition of the Basin;
- supporting economic development without compromising the Basin's aquatic system;
- promoting cooperation between Montana and British Columbia on resource development in the Flathead Basin;
- making recommendations to the Legislature regarding the preservation of the Basin's aquatic resources.

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